

Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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Correspondence

November 24, 1957

Dear Dr. Aitken:

I don't know when anything has ever pleased me more than did the editorial concerning me in the November 15 issue of the JOURNAL. It was beautifully done and I liked especially the "editorial comment" that came at the end. I rather imagine that you wrote it but if you did not, I would appreciate having this note passed on to whomever did because I am most grateful for this recognition by the JOURNAL of the nice thing that befell me. Although I am, by training, a physician, my interests lie in the field of disease in general, whether this be of animals or man. As it has turned out, most of my work has concerned disease in animals and hence is encompassed in the field of veterinary medicine.

It has been extremely gratifying to me that the veterinary profession has had the generosity and friendliness to adopt me almost as one of their own and I am proud to be thought of by that profession as one worthy of being included. Thank you very much for the friendly recognition you have just given me in the JOURNAL.

Sincerely,

s/RICHARD E. SHOPE, New York, N. Y.

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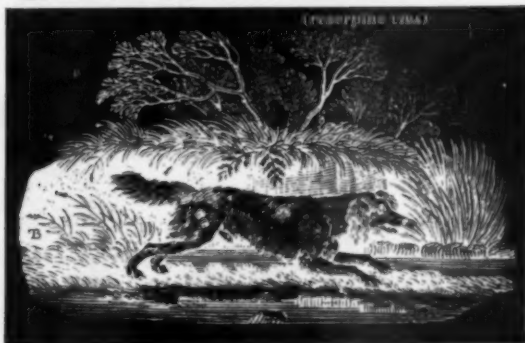
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1. Karmin, L. R.: *N. Am. Veterinarian* 36:846 (Oct.) 1955. 2. Earl, A. E.: *J. Am. Veterinary Med. Assoc.* 129:227 (Sept. 1) 1956.

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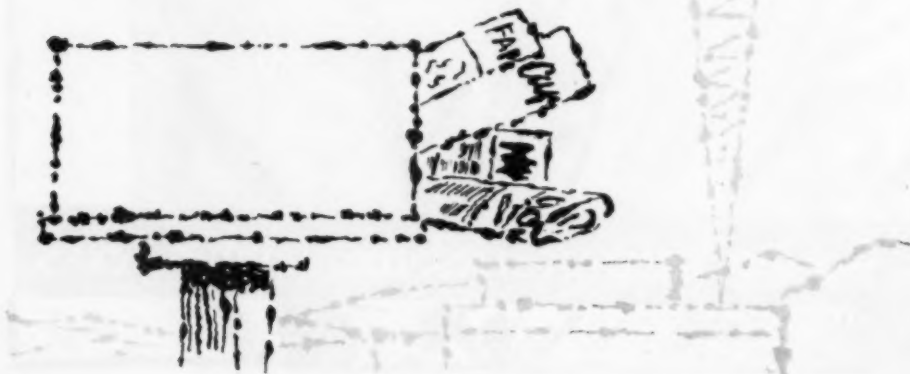


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Washington News



Legislative News.—Rep. Wilbur Mills (D., Ark.) is scheduled to take the chairmanship of Ways and Means Committee as result of the death of Chairman Jere Cooper (D., Tenn.) on Dec. 18, 1957. This important committee is scheduled to begin general tax revision hearings on Jan. 7, 1958, including the Jenkins-Keogh tax deferment plan (see JOURNAL, Sept. 15, 1957, adv. p. 6). Also pending before the Committee are many bills amending social security. Mr. Mills, a member of Congress for 18 years, is a recognized authority on taxation and social security.



Gen. J. A. McCallam

Until the administration budget is turned over to Congress early in January, no information on money requested for specific activities in U.S.D.A., H.E.W., and other departments will be available for publication. It is understood, however, that **total funds for the brucellosis eradication program** will be included in the U.S.D.A. budget. The administration program will also include considerable aid to science and education, but no direct help to medical schools and students. With added emphasis on science and engineering, Congress may not push the administration plan for broadening the P.H.S.

Act to allow medical, dental schools, etc., to receive matching grants for constructing classrooms (see JOURNAL, June 15, adv. p. 18; July 15, 1957, adv. p. 10).

It should be remembered bills not finally acted on during the First Session of the 85th Congress hold their legislative position in the session opening in January. In this connection, see JOURNAL, Dec. 15, 1957, Part 2, Business Session, Ninety-Fourth Annual Meeting, p. 18.



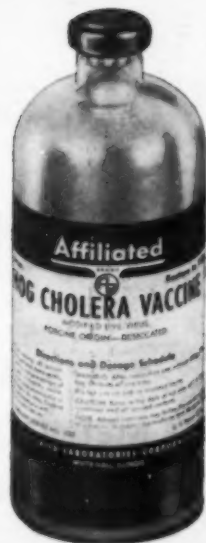
Miscellaneous.—Food and Drug Administration has started an **advisory information service** designed to keep interested groups posted on rulings and policy statements pertaining to food, drug, and cosmetic laws. Statements will be published in the Federal Register from time to time, and facts will come largely from letters written by F.D.A. officials in answer to questions raised by medical groups, trade associations, and others. Reprints will be sent to individuals and organizations on the F.D.A. mailing list.

Dr. Leslie Smith, a career P.H.S. officer, has been appointed to the newly created post of assistant administrator in the Federal Civil Defense Administration for health and medical affairs. He will serve as staff advisor to F.C.D.A. Administrator Leogh Hoegh. The A.M.A., A.H.A., and Association of State and Territorial Health Officers urged such a post be established when, following a F.C.D.A. reorganization, medical personnel in the agency were left without clear authority or channels of communication.

U.S.D.A. amends marketing agreement on hog cholera serum and virus. effective Dec. 23, 1957. Chief additions to previous marketing agreement and order:

- 1) Handling of all hog-cholera serum and virus now declared to be in interstate or foreign commerce, or as directly affecting such commerce.
- 2) All serum and virus handlers bidding on future business must bid only their effective posted price at time such bid is made.
- 3) The requirement that all deliveries of 3,000 cc. or more shall be prepaid has been eliminated.

The Commonwealth of Puerto Rico has been declared modified-certified brucellosis-free, thus joining nine states that have already qualified for certification. The latter are Connecticut, Delaware, Maine, Minnesota, New Hampshire, North Carolina, Vermont, Washington, and Wisconsin.



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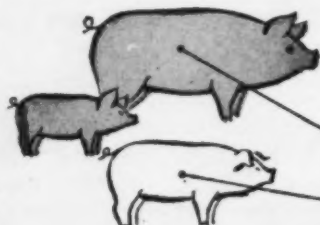


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By injecting 2 cc of Armidexan within the first three days after birth, a number of related benefits have been demonstrated:

Scours due to hypochromic anemia are avoided . . . Resistance to pneumonia and other infectious diseases is increased . . . Iron-rich pigs are not as subject to rhinitis, T.G.E., and "bull nose"

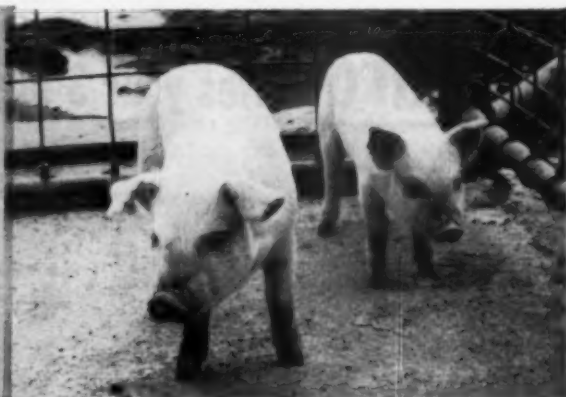
Tests show that Armidexan saves more baby pigs than oral iron methods.

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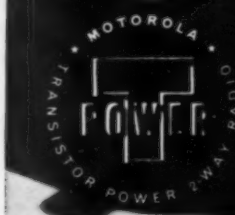
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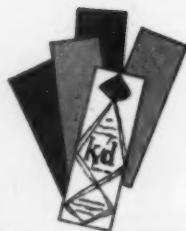


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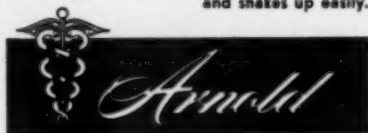
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The Complement-Fixation Test in Diagnosis of Eperythrozoonosis in Swine

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Manhattan, Kansas

LABORATORY DIAGNOSIS of acute eperythrozoonosis in swine sometimes presents difficulties because of the infrequent occurrence of parasites in the blood during the clinical stage of the disease. A serological test would provide a means of confirming a questionable diagnosis when blood smears appear negative, or if the observer is uncertain or inexperienced in detecting the causative organism, *Eperythrozoon suis*.

The complement-fixation (CF) test was investigated because of the success of its application in the diagnosis of bovine anaplasmosis, a disease with certain similarities to eperythrozoonosis. The CF test developed closely follows that used in anaplasmosis diagnosis.²⁻⁵

MATERIALS AND METHODS

Antigens were produced from splenectomized pigs which had been experimentally infected with *E. suis*. Citrated blood was obtained from the anterior vena cava early in the disease when the parasites were most abundant. Serum was removed by centrifugation, and the red cells washed three times in physiological saline solution.

One volume of washed erythrocytes was added to 30 volumes of water saturated with carbon dioxide (the latter was prepared by adding approximately 100 Gm. of dry ice to a liter of cold, distilled water). The resulting sediment was allowed to settle overnight at 3 C., and on the following morning was collected and washed several times in cold distilled water until the supernatant fluid was color-free. The centrifuged volume of washed precipitate was measured, then neutralized with 1.2 per cent sodium bicarbonate, and dissolved in sufficient physiological saline solution to make a

final volume three times that of the precipitate. The antigenic material was then lyophilized and stored at -25 C.

Prior to each test, the antigen was weighed and re-suspended in veronal bicarbonate buffered salt solution⁷ at the rate of 5 mg. per cubic centimeter. The antigen was titrated in twofold dilutions against a known positive and negative serum. The optimum dilution of antigen was that near the midpoint of the range between the highest dilution giving complete fixation in positive serum, and the highest dilution giving a reaction in negative serum. Five different antigens were prepared by the method described, and found to be of similar antigenicity.

In the CF test procedure,⁸ reagents of the hemolytic system were standardized spectrophotometrically. The total volume was 1.5 ml. with the essential test reagents being added in 0.3-cc. amounts. Preliminary incubation was for one hour in the water bath at 37 C. An optional concentration of hemolysin was used to sensitize a 2 per cent sheep-cell suspension, and the mixture then added to the test in 0.6-cc. amounts. After 30 minutes' incubation in the water bath at 37 C., readings were made visually and spectrophotometrically against prepared standards. Visual readings of 4+ (no hemolysis), 3+, and 2+ were regarded as positive, and 1+ or 0 (complete hemolysis) as suspicious to negative. Spectrophotometric readings of 0 to 80 per cent hemolysis were regarded as positive, and 81 to 100 per cent as suspicious to negative.

Serums used in the test were obtained from pigs in all stages of eperythrozoonosis and from known susceptible animals. To determine the specificity of the test, serums were also obtained for testing from 6 pigs affected with hog cholera, 3 suffering from experimentally induced carbon tetrachloride poisoning, 8 reacting positively in dilutions of 1:100 or more to the *Leptospira pomona* agglutination-lysis test, 6 baby pigs affected with iron deficiency anemia, 2 pigs with suspected warfarin poison-

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ing, and 3 displaying anemia and icterus of unknown cause.

Inactivation of the complementary activity of swine serum¹ was investigated. In initial tests of positive and negative serums (including negative reacting serums of known carriers), no marked enhancement of the accuracy could be detected and, as a result, further trials were not attempted.

RESULTS

In 30 known susceptible pigs, the serum reactions were found negative at all times until the development of heavy parasitic infections and clinical symptoms. As indicated (table 1), positive CF reactions commenced one to seven (av. 2.5) days after the onset of clinical illness. Reactions continued to be positive for 14 to 21 days or longer and then became negative. As additional relapses occurred in these splenectomized pigs, reactions again became positive or continued positive until abatement of further attacks.

Positive reactions in end point titrations of serums increased rapidly as the acute disease progressed. The highest titers varied from 1:160 to 1:640, then decreased as the animals recovered. Three animals

TABLE 1—Complement-Fixation Diagnosis of Acute Eperythrozoonosis After the Onset of Signs of Clinical Illness in Experimental Pigs

No. of animals	Beginning of positive CF reactions
7	1 day after clinical signs.
9	2 days after clinical signs.
9	3 days after clinical signs.
3	4 days after clinical signs.
1	5 days after clinical signs.
1	7 days after clinical signs.

with known cases of the disease gave positive reactions in serum dilutions of 1:40 to 1:640.

Fifteen nonsplenectomized pigs were experimentally infected with *E. suis* to determine CF reactions in pigs with mild cases and those known to be carriers of the disease. Reactions became positive in most animals 13 to 30 days after inoculation and continued positive for one to four weeks. Reactions then became negative in the majority of the animals. Negative CF tests were obtained consistently in 10 other pigs known to be carriers of the disease.

The specificity of the test was demonstrated when serums of 28 pigs known to

be affected with diseases other than acute eperythrozoonosis all reacted negatively.

When bovine anaplasmosis antigen was substituted for *E. suis* antigen in the test, it was found that a nonspecific positive reaction occurred in many but not all positive serums. Negative serums were usually negative to the anaplasmosis test. Normal bovine red blood cell antigens gave similar reactions to end point titrations of positive serums, indicating a reaction to the erythrocyte stroma rather than to Anaplasma.

DISCUSSION

The data obtained indicate that the CF test can be useful in the laboratory diagnosis of acute eperythrozoonosis in swine. Serums should be obtained from pigs that have been sick for two or more days and, preferably, from several affected pigs in the herd. Limitations of the test should be recognized.

In acute cases, the short time that detectable CF antibody has been present in the serum adds to the accuracy of the test. Positive reactions may generally be regarded as the result of recent infection. The test, however, is of no value in determining the carrier status of an animal. The anaplasmosis CF test may be used in diagnosis; however, the reaction is apparently nonspecific and accuracy is not as great as when *E. suis* antigen is used.

SUMMARY

1) A complement-fixation test similar to that used in diagnosis of bovine anaplasmosis was found useful in diagnosing acute eperythrozoonosis in swine. Antigens were prepared from carbon dioxide precipitated red blood cells heavily parasitized with *Eperythrozoonosis suis*.

2) Serums from affected animals became positive in an average of 2.5 days after the onset of clinical illness, and continued positive for approximately two to three weeks. Carriers of the disease were generally negative to the test.

3) Nonspecific positive reactions to the anaplasmosis CF test occurred in the majority of serums from swine acutely affected with eperythrozoonosis.

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United States Livestock Sanitary Association—1957

The sixty-first annual meeting of the U.S.L.S.A. was held in the Chase-Park Plaza Hotel, St. Louis, Mo., Nov. 13-15, 1957, with Dr. G. H. Good, Cheyenne, Wyo., presiding.

The officers elected for the 1958 meeting are: Dr. J. G. Milligan, state veterinarian, Montgomery, Ala., president; Mr. F. G. Buzzell, livestock commissioner, Augusta, Maine, first vice-president; Drs. J. R. Hay, director of agriculture, Columbus, Ohio, second vice-president; A. P. Schneider, state veterinarian, Boise, Idaho, third vice-president; R. A. Hendershott, state veterinarian, Trenton, N. J., secretary-treasurer.

INFECTIOUS DISEASES OF CATTLE (COMMITTEE REPORT)

Mastitis.—This is still probably the most costly of dairy cattle diseases in this country. More research is indicated to delineate the most important predisposing factors. However, present knowledge, if applied with vigor, would decrease losses greatly.

Shipping Fever.—The shipping fever complex still merits our close attention; while *Pasteurella hemolytica* seems to be an important agent, it could produce severe infection only in calves that already had an inapparent chronic pneumonia prior to exposure. A similar lesion could be produced with a filterable agent. Demonstration of a filterable agent as a cause of a febrile respiratory disease in cattle and of pneumonia in sheep, and the identification of a separate agent for bovine rhinotracheitis, suggest that our knowledge of shipping fever may soon be considerably improved.

Infectious Bovine Rhinotracheitis.—This disease continues to appear where it has been reported previously but in less dramatic epizootics. It has been reported in about 30 states, ten or 12 more than last year. The vaccine has demonstrated that it has practical value.

Virus Diarrhea and Mucosal Diseases.—More than one virus is capable of producing clinical signs of illness similar to virus diarrhea. Mucosal disease can also be reproduced by an infectious agent. While these agents are distinct from the rinderpest virus, the similarity should cause continued vigilance.

Listeriosis.—*Listeria monocytogenes* has long been associated with fatal meningoencephalitis in cattle and other species including man, but its importance as a cause of abortion and possibly of sterility in cattle had not previously been considered. Inapparent infection in the dam may result in death of the fetus in utero and abortion, or in death soon after birth. Demonstrating that skunks and raccoons may be affected during an epizootic indicates that wild mammals, and probably birds, may serve as reservoirs of the disease. Serological methods of diagnosis are under study but, at present, listeriosis can be diagnosed only by isolation of the organism, usually from brain cultures.

Anthrax.—From July to mid-September deaths occurred in animals in three states as follows: In Oklahoma, 957 animals died in 457 herds (cattle, 886; horses, 13; sheep, 37; swine, 19; and others, 2). In Kansas, 670 animals died in 284 herds (cattle, 617; horses, 2; sheep, 2; swine, 49). In Arkansas, 80 animals died in 20 herds (cattle, 50, and horses, 30).

In Montana, 16 animals died on four premises—the first outbreak in three years and the first in that county since 1918. On the Idaho-Utah border, 11 cows died of anthrax—the first deaths in that area in 20 years.

Animals which were treated and recovered are not reported since there was no reliable way of determining whether anthrax was involved. The epizootic was complicated by blackleg, malignant edema, leptospirosis, and anaplasmosis. One owner, who was infected when he opened a cow, recovered, as did a veterinarian who developed anthrax on the back of his hand from an insect bite.

In line with the general concept of an-

thrax, it appeared late in summer, was preceded by spring floods, and flies were numerous. Many infected animals apparently were successfully treated with large doses of penicillin during the early febrile stage. Vaccination was effective.

Breeding Diseases.—As eradication of brucellosis progressed, more attention was given to other genital infections.

The demonstrated possibility of wide dissemination of diseases such as vibriosis and trichomoniasis by artificial insemination, in spite of the use of antibiotics, indicates that periodic health examinations of all bulls should be required. Also, breeding animals which carry genetic defects such as dwarfism, prolonged gestation, and epitheliogenesis imperfecta should be eliminated. An epizootic form of abortion has been recognized in California; the nature of the infectious agent has not been demonstrated.

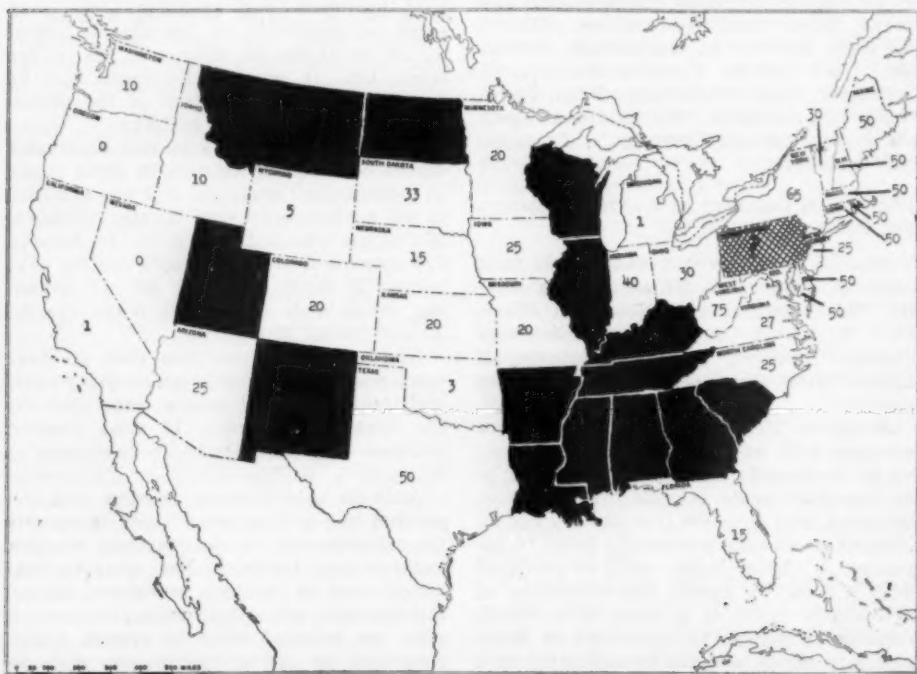
Johne's Disease.—Many states report that Johne's disease is increasing and has been introduced into flocks of sheep as well

as herds of cattle by the purchase of infected animals. There is emphatic need of more research.—*D. E. Jasper, Chairman, Univ. of California.*

TRANSMISSIBLE DISEASES OF SWINE (COMMITTEE REPORT)

To control vesicular exanthema, hog cholera, and trichinosis, it is necessary to cook all garbage fed to swine, yet the entire swine industry is jeopardized by the failure of a few states to require garbage cooking.

Hog Cholera.—As of June 1, 1957, 14 states (fig. 1) did not permit the use of virulent virus for hog cholera vaccination, and none was used in two other states. In only ten states (9 of them in the extreme northeastern section, the other being Texas) was virulent virus used in 50 per cent or more of the pigs vaccinated. On March 13, 1957, a bill (HR 5933) "to control the preparation, distribution, importation, and exportation of virulent hog cholera virus . . ." was introduced into Congress. At a



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Fig. 1—This map shows the 14 states (black) which prohibit the use of virulent hog cholera virus. The numbers on the other states indicate the percentage of immunized hogs vaccinated with virulent virus in 1957.

hearing on this bill, July 24, 1957, it was supported by six nationwide organizations and opposed by a single individual, yet the bill was tabled. However, passage is expected.

Reports on swine diseases were received from 32 states in reply to a questionnaire. All agreed that the incidence of diseases in swine had been reduced by discontinuing the feeding of raw garbage.

Hog cholera was relatively prevalent in nine states. There was an increase over previous years in only one state, no change in nine, and a decrease in 17 states.

Swine Erysipelas.—In all major swine-raising states erysipelas was a problem; it was serious in 12. There was an increase in seven states, no change in 17, decrease in two, while one state had no erysipelas, and another had not recognized the disease in 20 years. Since some areas are relatively free of erysipelas, when the relatively susceptible swine from those areas are moved to where the disease is enzootic, large losses result.

Atrophic Rhinitis.—This condition was recognized as a serious problem in eight states, was not serious in 22, had increased in seven, had not changed in 12 states.

Leptospirosis.—Leptospirosis was recognized as a serious problem in 26 states, had increased in nine, and one state reported none.

Transmissible Gastroenteritis.—This disease was a serious problem in four states; it had increased in two, not changed in 20, and had decreased in 20.

Enteritis.—This complex was considered serious in nine states, had increased in one, not changed in 19, and was decreasing in two.

Respiratory Diseases.—These infections were serious in nine states, increasing in one, unchanged in 16, and decreasing in two. Climate did not seem to be a factor.

Eperythrozoonosis.—Eperythrozoonosis was serious in only two states, increasing in three, and was not recognized in several eastern and northeastern states.

Brucellosis.—Brucellosis had not been recognized in swine in one state, its incidence was estimated at 0.1 to 4.0 per cent in most states, and was over 25.0 per cent in two states (present beliefs do not support the contention that a large percentage of the swine population could be infected). Of the 32 states reporting, 14 had a swine

brucellosis-eradication program, 18 did not. Six states were concerned with the effect of swine brucellosis on their bovine brucellosis-eradication programs.

Vesicular Erythema.—This condition had not been recognized in over a year but it is too early to predict that it has been eradicated.—S. H. McNutt, Chairman, Univ. of Wisconsin.

TRANSMISSIBLE DISEASES OF POULTRY (COMMITTEE REPORT)

Passage of the federal "Poultry Products Inspection Act" in August, to be effective Jan. 1, 1959, is a milestone in efforts to provide wholesome meat products.

Respiratory Diseases.—Newcastle disease was less evident during the year. Either the vaccines were effective or the flocks had not been challenged. A second (booster) dose of vaccine was necessary to produce good immunity whether the vaccine was administered as a dust or in drinking water.

Infectious bronchitis appears to be effectively controlled, at least in part, due to the widespread use of the modified live virus vaccines.

Chronic respiratory disease (CRD) and infectious sinusitis control would seem to be complicated by finding that at least immunological types of the PPLO exist. There is additional proof that infectious sinusitis in the turkey can be transmitted through the egg. Of several chemotherapeutic agents tested, erythromycin and streptomycin seem to be the more effective against CRD.

Laryngotracheitis can be controlled effectively by proper vaccination but the disease still occurred, sometimes in vaccinated flocks.

Ornithosis is being studied at four schools under a coordinated research program. The objective is improved diagnostic techniques and a better understanding of its transmission, treatment, and control. A direct complement-fixation test for chicken and turkey serum has been reported.

Other Diseases of Fowl.—Fowl cholera has not recently appeared in epizootic form. Cholera is manifested in turkeys by gross changes resembling those of erysipelas, emphasizing the importance of cultural diagnosis.

Fowlpox was satisfactorily controlled by immunization by the "stick" method.

Avian leukosis complex showed no relationship between the age of parents and the leukosis incidence in the progeny. However, a reduction in the rate of shedding virus as the hens became older was reported. Chicks from hens vaccinated intraperitoneally with live virus were significantly more resistant than chicks produced by the same dams prior to immunization.

Avian encephalomyelitis (epidemic tremors) was reported to occur in chicks of pullets but not in chicks from old hens; also, there was a significant decrease in tremor incidence when pullets were vaccinated with live glycerinated avian encephalomyelitis virus. The disease has also been reported in the Mongolian pheasant.

Pullorum disease had responded to control to the extent that complete eradication from the United States should be considered. Thirty-six states have legal pullorum control requirements and 59.5 per cent of the chicken hatcheries are participating in the voluntary control program of the National Poultry and Turkey Improvement Plans. Official testings show that, with approximately 40 million chickens tested each year, the percentage of reactors has fallen from 0.24 in 1954 to 0.045 in 1957; for turkeys it fell from 0.09 to 0.06.

Paratyphoid—an official testing program for *typhimurium* has been discussed. Turkeys have been tested for several years with encouraging results.

Infectious hepatitis is a new disease of chickens; the causative agent, which can be cultivated in chicken embryos, has been isolated.

Erysipelas in turkeys appeared to be enzootic in many areas. It was most prominent a decade ago in the extreme northwestern states. As in swine, penicillin is the most effective treatment. A bacterin has provided reasonably good protection when repeated in 60 to 120 days.

Hemorrhagic syndrome was not a major problem the past year. The factors involved in the field disease have not been established.

Infectious synovitis appears to be cyclical. The virus is found in nearly all body tissue and may be spread through fertile eggs and could be recovered from chicks 6 days old. It can be controlled with certain antibiotics.—M. S. Hofstad, Chairman, Iowa State College, Ames.

BRUCELLOSIS (COMMITTEE REPORT)

Nine states are now qualified as modified certified brucellosis-free—North Carolina (1947), New Hampshire (1949), Maine (1951), Wisconsin and Washington (1956), and Minnesota, Delaware, Connecticut, and Vermont (1957). Many more states should reach this goal in the next two or three years. All must, if the United States is to be certified brucellosis-free by 1960.

It is believed: (1) that more additional research on the whey plate test is necessary before its value can be ascertained; (2) that there be further research in conducting and interpreting the BRT or ring test; and (3) that the use of the "shield and V" vaccination tattoo be restricted to work under the supervision of licensed, accredited veterinarians. The eradication of brucellosis in swine is encouraged, including the control of intrastate and interstate movement of swine which may be infected.—R. W. Smith, Chairman, Concord, N. H.

BIOLOGICAL AND PHARMACEUTICAL PRODUCTS (COMMITTEE REPORT)

Improved tissue culture techniques have made possible the development of new prophylactic agents. These include a modified live virus vaccine for infectious bovine rhinotracheitis, to be injected intramuscularly, which has produced good results; and a modified virus vaccine for infectious canine hepatitis, which is available alone or combined with a modified distemper virus prepared from chicken embryos as a dual vaccine. There is also a killed canine hepatitis virus of tissue culture origin. A hog cholera antibody concentrate is being developed; it consists of hog cholera antibodies concentrated from anti-hog cholera serum by fractionation.

A *Clostridium perfringens* antitoxin, including types B, C, and D, now available as a combination has value if used early.

Leptospira bacterins are now available for various species (*L. pomona* bacterin for cattle, swine, horses, and sheep; and one containing *L. canicola* and *L. icterohaemorrhagiae* primarily for dogs).

An avirulent *Sternotype* anthrax vaccine was successfully used on many thousands of cattle this year. It was also used experimentally on sheep.

An avian PFLO-diagnostic antigen has been produced primarily for research institutions and laboratories.

Cyanacetyldiazide, a formulation produced in Great Britain, seems effective in removing certain lungworms from cattle, sheep, and swine. When given subcutaneously or orally, it narcotizes the worms in the bronchioles, bronchi, and trachea sufficiently to permit their expulsion by the cilia of the epithelium.

Hygromycin, an antibiotic, is effective against helminths in swine. It is produced from *Streptomyces hygroscopicus* which was discovered in Indiana soil. When given with the feed, the result is a drastic reduction in the production of ova as well as the death of worms.

Tranquilizing drugs have been widely used in both large and small animals as chemical restraints.

Penicillin has been beneficial in preventing bloat when given in the feed several hours before the cattle are placed on certain legume pastures.

Iron therapy for anemia, in the form of an injectable iron dextran complex to be given intramuscularly, is especially valuable in pigs. One injection will provide the iron required for 50 to 60 days.—S. F. Scheidy, Chairman, Drexel Hill, Pa.

RABIES (COMMITTEE REPORT)

During the first six months of 1957, 2,050 cases of rabies in all species of animals were reported. This is a decline of 272 from the same period in 1956. It included three human cases. In 1956 (fig. 2), there were 2 more cases than in 1955 but the trend toward a reduction in dogs (65 fewer) and an increase in wildlife (164 more) continued. Compared with 1946, the total number of cases had dropped from 10,872 to 5,846, the canine cases from 8,384 (78.0%) to 2,592 (45.0%), while wildlife cases had increased from 956 (8.8%) to 2,079 (35.6% of all cases). Also during this decade, cases in livestock had dropped from 1,055 to 794 and in man from 22 to 10. Rabies virus has been isolated from approximately 150 bats of 14 species from 15 states. All cases in man were due to dog bites except one due to a cat bite, and one from working with rabid bats. Only 2 were given vaccine therapy and neither was completed, 1 due to an extremely short incubation period (16 days); the other was terminated after seven doses, against the physician's advice.

When pups, 5 months old, were given

chicken embryo modified living virus rabies vaccine, 9 of 10 which were vaccinated intramuscularly resisted infection nine months later while only 6 of 17 vaccinated subcutaneously resisted infection five



Fig. 2—Rabies reported during 1956. Alaska reported 15 cases; Hawaii, none; and Puerto Rico, 23.

months later. This demonstrates the importance of intramuscular inoculation with this product.—V. D. Chadwick, Chairman, Jackson, Miss.

CATTLE GRUB CONTROL (COMMITTEE REPORT)

Research has finally produced a few systemic drugs which will destroy Hypoderma larvae in the tissues before they have caused evident damage. A phosphate compound known as Dow ET-57 (Trolene) given orally (1.6 oz./1,000-lb. animal) in a single dose is effective. Another phosphorous compound, Bayer 21/199, shows promise and, unlike ET-57, it can be sprayed on the animal, being absorbed through the skin. Other compounds are still being tested.—F. R. Koutz, Chairman, Columbus, Ohio.

VESICULAR DISEASES (COMMITTEE REPORT)

Foot-and-mouth disease (aftosa) has not occurred in the United States since 1929 and vesicular exanthema was last reported in November, 1956. In contrast, vesicular stomatitis, which is now well established in certain areas, is believed to have existed in this country during Civil War days.

A new wave of foot-and-mouth disease is sweeping over Europe with 89,929 infected farms in France alone. It is also more severe in Turkey than in the past 20 years.

Vesicular exanthema has not been reported for over three years except in South Carolina, California (Nov., 1955), and chiefly in New Jersey where a garbage-cooking law became effective Jan. 1, 1958. The greatest remaining opposition to garbage cooking is among feeders in Connecticut and Massachusetts.

Vesicular stomatitis may affect an entire herd of cattle but usually only a few animals show signs of the disease. Teat lesions are most commonly reported and may be accompanied by drastic reduction in milk production for varying periods. It has been observed frequently in swampy, wooded lowlands but this year it was found in mountain areas of West Virginia and Virginia. Also, over 300 herds in southeastern Oklahoma and southwestern Arkansas were affected. The term "mycotic stomatitis" is often used in the absence of vesiculation but, serologically, these animals often are positive for vesicular stomatitis, New Jersey type.

Cooperative field and laboratory studies, regarding virus reservoirs and modes of transmission of vesicular stomatitis, continue. Attempts to immunize against the disease with inactivated embryo-propagated virus require additional study.—*F. J. Mulhern, Chairman, U.S.D.A., Washington, D. C.*

ANAPLASMOSIS (COMMITTEE REPORT)

As a result of the use of the complement-fixation test and slaughter of the reacting carrier animals, the eradication of anaplasmosis from the Territory of Hawaii is nearing completion. The disease has also been eradicated from a number of herds in eastern and southeastern states where, as in Hawaii, the vectors spread the infection mechanically. Thus, it appears that anaplasmosis can be eliminated where: (1) it is not firmly entrenched; (2) the insect vectors transmit the disease by mechanical means; (3) sprays are used to assist in the control of the vectors; (4) surgical instruments, needles, tattooing equipment, etc., are kept sterile; and (5) where an intensive regulatory program is maintained.

In other areas, anaplasmosis continued to spread and cause heavy losses. There is no practical method of eradicating carrier ticks which transmit the etiological agent through the egg for many generations—as

long as four or five years. Slaughter of immune carrier cattle where there is an abundance of infected ticks does not seem practical. Parts or all of 11 western states are affected by tick-borne anaplasmosis. The committee recommends that the ARS conduct an experimental test and slaughter program on a heavily infected ranch where ticks are abundant.

A standard procedure for the anaplasmosis complement-fixation test has been developed.—*John Christensen, Chairman, Davis, Calif.*

Drug-Marketing Evils.—Drugs are discovered, manufactured, and tested by scientific methods, but they are marketed through a blend of personal and social motives. In the 30 years from 1905 to 1935, new drugs were introduced into the "Pharmacopeia of the United States" at an average of six per year; in the succeeding 20 years, at an average of 37 annually.

Combining drugs has added to the physician's dilemma. As of November, 1956, 29 marketed preparations contained two antibiotics, 20 contained three, eight contained four, and four contained five antibiotics each. Whether there is a good reason for the use of any of these 61 mixtures is questioned. There are 33 different antihistaminic drugs being sold, all having practically identical actions, but different names and dosages. Similar excesses are found with vitamins, antispasmodics, and tranquilizers.

Physicians are advised: (1) to learn the mechanisms by which drugs work rather than heeding what somebody says they will do, (2) to remember the generic name which tells something about the drug, and (3) to avoid substituting drugs for diagnoses.—*J.Am.M.A. (Oct. 12, 1957): 657, 688.*

Behavior in Castrated Starlings.—The aggressive behavior of animals of various species usually decreases when they are castrated or their social rank increases when they are injected with testosterone. However, no change in activity or rank occurred in 16 male starlings which were castrated and, three to five weeks later, were given different doses of testosterone. Their aggressiveness may result from androgen from a different source.—*Science (Aug. 9, 1957): 253.*



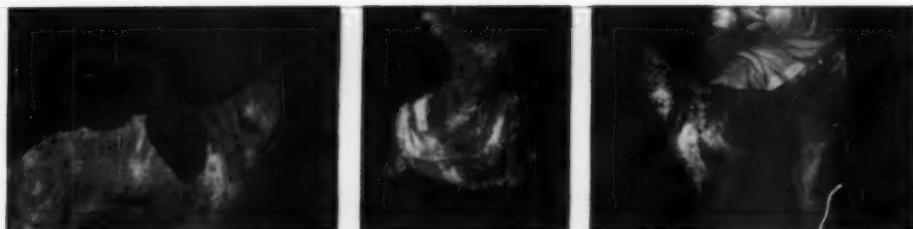


Fig. 1 — Chronic suppurative dermatitis in a Pointer showing acanthosis and alopecia before (left and center) and after (right) treatment.

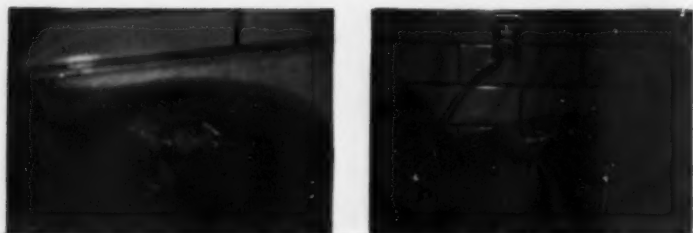


Fig. 2 — Suppurative dermatitis of long standing in a Dachshund, before (left) and 12 days after onset of treatment (right).

The Use of a Therapeutic Shampoo in Small Animal Dermatoses

G. S. TREVINO, D.V.M.

College Station, Texas

DURING THE HOT MONTHS of the year, especially in areas such as the gulf coast region of Texas where the temperature and humidity are relatively high, dermatopathic cases constitute a significant aspect of small animal practice. It has been shown that high temperature and humidity weaken the defensive powers of skin.¹⁻³ It has also been shown that removal of the protective surface film is an important factor in producing dermatitis in man⁴ and external otitis in cats.⁵

Besides adversely affecting the protective mechanisms of the skin, high temperatures are favorable to the propagation of many ectoparasites, such as fleas, ticks, mosquitoes, blowflies, lice, and others. The bites of these insects are sometimes responsible for initiating pathological changes which make bacterial invasion of devitalized skin possible.

Many chemotherapeutic agents designed to allay pruritus, control ectoparasites, dry lesions of moist eczema, and encourage the healing of such lesions are available. This is a report on a new preparation, Fosteen,⁶ a cream shampoo that combines 2 per cent salicylic acid, 2 per cent micropulverized sulfur, and 1 per cent hexachlorophene with a specially effective antiseborrheic base consisting of sodium lauryl sulfoacetate, sodium alkyl aryl polyether sulfonate, and sodium dioctyl sulfosuccinate. It seems to combine the desired qualities and, in addition, has an agreeable odor.

EFFECT OF SHAMPOO ON DERMATOSES

In our clinic, this shampoo has been used in well over 300 cases of specific and non-specific dermatoses in dogs and cats. It has proved to be superior to any other therapeutic shampoo we have used, including selenium sulfide and cadmium sulfide. It has been used—either by itself or in combination with specific fungicides, bactericides, acaricides, or systemic therapeutic

agents—in moist eczema, seborrheic dermatitis, suppurative dermatitis, demodectic mange, and ringworm. In the last two conditions, it has little curative effect but, by dissolving sebaceous plugs and removing surface debris, it enables the acaricide or fungicide to act more effectively. Moreover, the product is pulicidal and pediculicidal, and it appears that it may be lethal to the larvae of *Trombicula*, the common chigger mite.

Method of Application.—The animal's coat is first thoroughly moistened. Then a small amount of the shampoo is rubbed into the coat, particularly on the affected areas, to produce a lather which is then rinsed off completely. The shampoo is again applied and the lather is left for ten minutes before it is rinsed off. The frequency of application depends on the condition being treated.

Moist Eczema.—After the hair surrounding the lesion has been clipped, the animal is bathed with the shampoo once daily for two or three days. This is usually followed by dryness of the lesion and allayed pruritus. A soothing ointment or cream may then be applied to soften the scabs and some restraint appliance is utilized to prevent self-mutilation.

Seborrheic Dermatitis.—Dramatic improvement is observed in animals with seborrheic dermatitis after two or three baths with the shampoo. These are given either on successive or alternate days, depending on the response.

Suppurative Dermatitis.—Most pyogenic bacterial infections respond favorably to the shampoo. Acneiform lesions tend to dry and disappear after a few applications. Between baths, some bactericidal ointment or solution may be employed. The results of treatment of chronic cases are illustrated. A female Pointer, 10 years old, with suppurative dermatitis, acanthosis, and alopecia (fig. 1, see insert on opposite page) was treated for approximately four weeks, and a male Dachshund, 4 years old, with a chronic infection of the skin (fig. 2, insert, opposite page) was treated for two weeks.

Demodectic Mange.—In this condition,

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⁶Fosteen is the product of Westwood Pharmaceuticals, Division of Foster-Milburn Co., Buffalo, N. Y.

the shampoo is not employed by itself. It is a valuable adjunct in that it permits the acaricide to penetrate the skin more effectively. This treatment has been used in 43 cases of generalized demodexia with gratifying results.

Ringworm.—In the treatment of ringworm, it is necessary to remove the scabs overlying the lesions before applying the fungicidal agent. Although this shampoo has only limited fungicidal powers, its cleansing and keratolytic actions make it useful between treatments with the fungicide.

DISCUSSION AND CONCLUSIONS

The use of this new therapeutic shampoo, Fosteen, does not obviate concomitant therapy with corticosteroids, other hormones, antihistamines, prescription diets, sedatives, specific parasiticides, and bactericides. It is not a panacea for all diseases of the skin and should not be expected to be effective when the skin disorder is merely a manifestation of systemic disease. However, when used according to directions in the conditions mentioned, it is of value. No toxic effects were noticed. In 4 animals, the product was left on the skin for 24 hours with no untoward effects. However, this manner of using it should not be routinely employed, since it may result in marked keratolysis and xeroderma and, in some sensitive animals, particularly pups, some irritation may be provoked. When dispensed, it should be put in glass ointment jars with plastic caps, since an undesirable chemical reaction occurs when the product is put in metallic ointment packages.

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ET-57 (Trolene) for Demodectic Mange—A Case Report

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Recently it was announced that a single oral dose of the chemical, ET-57 (Trolene*), destroyed most of the migrating grub larvae in cattle.¹ These favorable results in cattle stimulated an interest in treating demodectic mange in dogs with the same product. Through correspondence,^{2,3} it was learned that this drug had been used in dogs with demodectic mange at the recommended oral dose of 100 mg. per kilogram of body weight once weekly, but with only moderate success. The topical form of the drug was also known to be effective against some ectoparasites of dogs.² Since the drug was known to be relatively nontoxic even in large doses,^{2,3} it was decided to use both the oral and topical preparations simultaneously and at higher levels than had been used.

A 15-lb. male Beagle, 1 year old, with demodectic mange was obtained from a kennel in which mange was a problem. (A litter mate had recently died from the disease in spite of extensive treatment.) This dog had been hospitalized and treated for three months with many preparations but was becoming progressively worse. He was thin, listless, and the front legs, muzzle, ears, throat, chest, and flanks were denuded and ulcerated. Microscopic examination of skin scrapings revealed many mites (*Demodex canis*) in each field. The dog was also infected with hookworms and whipworms and suffered from chronic diarrhea.

On March 3, he was scrubbed for 15 minutes with hot water and soap and the skin was thoroughly massaged. After being dried, every visible lesion was scrubbed vigorously with gauze soaked in the topical preparation until the skin was a bright cherry red, after which 2.0 Gm. (1,000 mg. active drug) of the oral preparation was given in gelatin capsules. During the next 18 days, treatment was repeated six times and an additional 4.5 Gm. was given orally (table 1).

On March 19, three deep skin scrapings

*From the Department of Veterinary Science, Ohio Agricultural Experiment Station, Wooster.

¹Trolene was furnished by the Dow Chemical Co., Midland, Mich., in topical form, M 946 (a 5% preparation) and oral form, M 941 (a 50% emulsion).

TABLE 1—Treatment of a 1-Year-Old Beagle with ET-57 (Trolene) for Demodectic Mange

Date	Topically*	Orally**
3-3-57	Treated	2.0 Gm.
3-5-57	Treated	—
3-7-57	Treated	0.5 Gm.
3-10-57	Not treated	1.0 Gm.
3-11-57	Treated	—
3-14-57	Treated	1.0 Gm.
3-18-57	Treated	1.0 Gm.
3-21-57	Treated	1.0 Gm.

*ET-57 for topical application (5% solution); **for oral administration (50% emulsion).

revealed 2 dead mites but on March 22, one day after a warm water bath with a selenium sulfate solution, six deep skin scrapings from the worst affected areas, all of which drew blood, were negative. The skin lesions were healed, the hair was growing in all the areas, and the dog had gained 3 lb. The diet throughout the experiment consisted of cooked lean meat, whole milk, and dog biscuits.

The dog was not treated for hookworms and whipworms since it was thought that the ET-57 given orally might eliminate these parasites. However, at the end of the experiment, both hookworm and whipworm ova were found in the stools, and the diarrhea continued. On March 31, the dog was again bathed, using the selenium sulfate solution, and sent home. Nine weeks later, there were no signs of mange. Conclusions should not be based on the treatment of 1 animal and an observation period of only nine weeks, but the apparent recovery was so prompt and complete that it should be reported.

There was no evidence of intoxication and, since toxicity studies on dogs had been made,^{2,3} no effort was made to do any clinical laboratory studies such as blood counts or urinalysis. The dog may have been anemic but, if so, the condition did not interfere with recovery.

This drug might also prove to be effective against the larval form of *Demodex immitis* and other migrating larvae. If research should prove that these larvae are susceptible to the action of ET-57, then dogs could be given periodic prophylactic treatment for heartworm.

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Sexual Odor in Boar Meat

After 15 weeks on experiment, at the University of Idaho, male hogs which averaged 291 lb. were slaughtered (3 per group), and samples of loin from each were boned, roasted, and judged for odor and flavor.

Meat from boars fed 50 mg. of stilbestrol daily for the 105 days had slightly more odor and flavor than did meat from early castrated barrows. When boars were either fed 10 mg. of stilbestrol daily, or were castrated at the beginning of the experiment and injected with 10 mg. of testosterone daily, the meat of both groups had slightly stronger odor and flavor than did meat from the previous group. Meat from boars treated only by surgical removal of the preputial diverticulum at the start of the experiment had about double the odor and flavor of the barrow meat but less than two thirds as much as untreated boar meat. There were no significant differences in the groups, in gains, weight of testes, or concentration of epididymal sperm.—*Abstr. in J. of Anim. Sci. (Nov., 1957): 1024.*

Poliomyelitis in Mice Prevented by a Drug.—Mice inoculated intraperitoneally with poliomyelitis virus, type 2, were less susceptible (46 of 117 survived) when four daily injections with diazouracil were started the day before infection, than when started two days after infection (13 of 119 survived). However, the drug did not protect monkeys. The drug may act by interfering with the nucleic acid metabolism involved in virus replication but this remains to be proved.—*Science (Nov. 29, 1957): 1115.*

Desalting Sea Water by Freezing.—Sea water can be purified for drinking and for irrigation by freezing, but equipment will have to be vastly improved before it can be done economically. At the freezing point, the water freezes out of a salt solution, leaving behind constantly increasing concentrations of the salts. At present, 1,000 gal. can be desalted by freezing at a cost of \$2.32, and by distillation at a cost of \$1.94. For drinking, the cost would have to be less than 40 cents, and for irrigation less than 12 cents, per 1,000 gal.—*Sci. News Letter (Nov. 23, 1957): 328.*

Diagnosis of Leptospirosis from Urine Specimens by Direct Culture Following Bladder Tapping

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THE CURRENTLY ACCEPTED procedure for isolation of leptospiras from urine is an indirect method which involves the inoculation of laboratory animals, with subsequent multiple cardiac punctures and culture of the animal blood. This method is necessary because urine specimens are frequently contaminated, even though collected with sterile catheters. This paper describes a method by which urine may be obtained without contamination from living animals, or at necropsy, for direct inoculation into a culture medium.

During field studies on leptospirosis in animals, it was apparent that a better isolation technique was needed. The animal inoculation method involved so much work that it was necessary to limit the number of specimens cultured to five or ten at any one time. For example, if ten urine specimens were cultured, each was inoculated into 3 hamsters or a total of 30 hamsters. Approximately five blood samples were taken from each hamster, a total of 150

um, and isolations have been made as early as the fifth day after inoculation.

Another disadvantage of the animal inoculation method is the possibility that the animals used may be natural carriers of leptospiras. *Leptospira ballum* has commonly been found among laboratory white mice¹ and this animal should not be used for isolation. *Leptospira icterohaemorrhagiae* has been reported to be common among laboratory rats,⁴ and natural infection with this serotype has occurred among guinea pigs.² In Europe, *Leptospira grippotyphosa* has been isolated from naturally infected hamsters.³ Adequate studies have not been made on other laboratory animals to determine whether they are natural carriers of leptospiras.

METHODS

Direct Culture of Urine from Living Animals—In living dogs, the urine samples were obtained by puncture of the bladder

TABLE 1—Findings by Direct Urine Culture and by Microscopic Agglutination Tests of Serum from a Canine *Leptospira canicola* Carrier and from 4 Pups Experimentally Infected with *L. canicola*

Study		Leptospira canicola titer															Total
		Rise			Peak			Fall									
		512	1,024	2,048	512	1,024	4,096	1,024	512	256	128	64	32	16	0		
A) Canine <i>L. canicola</i> carrier	N	.....	.....	.....	.....	.....	.....	.....	2	1	0	2	2	0	0	7
	+	.....	.....	.....	.....	.....	.....	.....	2	1	0	1	0	0	0	4
	%	.....	.....	.....	.....	.....	.....	.....	100	100	0	50	0	0	0	57
	C	.....	.....	.....	.....	.....	.....	.....	0	2	2	1	0	0	0	5
B) Pups experimentally infected with <i>L. canicola</i>	N	1	2	1	4	3	2	3	4	3	8	8	2	1	5	47	
	+	1	2	1	1	3	2	2	1	2	6	4	2	0	2	29	
	%	100	100	100	25	100	100	67	25	67	75	50	100	0	62	62	
	C	0	0	0	0	0	1	0	0	1	2	0	0	1	0	5	

N=Number of urine specimens cultured; +=leptospiras isolated; %=percentage positive; C=contaminated.

blood specimens. Each specimen was inoculated into a minimum of four tubes of medium, a total of 600 tubes. Darkfield examinations were made at two weeks and four weeks, 1,200 examinations. Frequently, one to two months lapsed before isolations were made. In contrast, urine obtained following bladder tapping can be cultured directly into four tubes of medi-

um, and isolations have been made as early as the fifth day after inoculation. The bladder could be tapped with the animal in a standing position (fig. 1), but the best results were obtained by suspending the animal by its hindlegs (fig. 2, 3). The abdomen was thoroughly swabbed with 70 per cent alcohol. Then with a sterile, dry 10-ml. syringe and a 3-inch, 20-gauge needle the bladder was punctured and 3 to 5 ml. of urine withdrawn. Three drops of urine was inoculated immediately into each of four

From the Department of Health, Education and Welfare, Public Health Service, Bureau of State Services, Communicable Disease Center, Atlanta, Ga.

screw-capped tubes (16 mm. x 125 mm.) containing 5 ml. of Fletcher's semisolid medium.³

If the bladder is nearly empty, it is impossible to obtain urine. However, most sick dogs have full bladders. Attempts to tap the bladder should be started early in the morning. If no urine is obtained, the animal should be given exercise and water to drink; then bladder tapping should be tried again in one half to one hour.

Direct Culture of Urine at Necropsy—The necropsy should be done as soon after

death as possible. Isolations will probably not be made if the animal has been dead longer than one hour.⁴ Prior to necropsy, small animals were dipped into 10 per cent liquor cresolis solution for 15 minutes. Large animals were swabbed with the solution. Sterile instruments were used to remove the skin; then with another set of sterile instruments the muscle and peritoneum were removed to expose the viscera. With a sterile dry 2.0-ml. syringe with a $\frac{3}{4}$ -inch, 25-gauge needle, the bladder was punctured, urine withdrawn (fig. 4), and



Fig. 1—Tapping the bladder of a male dog in a standing position.

Fig. 2—Tapping the bladder of a male dog in a suspended position.

Fig. 3—Tapping the bladder of a female dog in a suspended position.

Fig. 4—Tapping the bladder of a guinea pig at necropsy.

3 drops inoculated immediately into each of four screw-capped glass tubes (16 mm. x 125 mm.) containing 5 ml. of Fletcher's semisolid medium.

DISCUSSION

The bladder-tapping technique on living animals has been used satisfactorily on dogs and probably can be used on most pet animals, sheep, swine, goats, and young calves. It was tried on 1 cow without success. The technique at necropsy may be used for surveys at packing plants, wild animal surveys, or as a routine procedure in necropsies.

The technique has been used at necropsy on 48 cattle, 15 rats, and 60 experimentally infected guinea pigs. In living animals, it has been used on 20 dogs and 1 cat. *Leptospiras* were isolated from the urine of 5 (33%) of the 15 rats, 26 (43%) of 60 experimentally infected guinea pigs, 7 (47%) of 15 dogs, 4 (57%) of 7 urine specimens from a known canine *Leptospira canicola* carrier (table 1), and from 29 (62%) of 47 urine specimens from 4 experimentally infected dogs.

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Acids Increased in Malaria-Containing Erythrocytes.—Erythrocytes infected with malaria parasites were found, at Rockefeller Institute, to contain greater quantities of two nutrient acids, the vitamin folic acid and the closely related folinic

acid, than do normal cells. In duck erythrocytes containing malaria parasites, which produced severe infection, there were five to ten times the normal amount of these acids, a third of which was in the parasites, and the rest in the cytoplasm. Some antimalarial drugs may be effective by interfering with the parasites' use of the two growth acids.—*Sci. News Letter* (Nov. 30, 1957): 342.

Skin of Bovine Embryo Used for Human Grafting.—The skin from a 3-month-old bovine embryo, while not as effective as frozen or fresh human skin, has given a satisfactory covering as a graft on man for about eight days. All grafts except those from an identical twin eventually slough. Mucous membrane from the stomach and intestines of animals has also been used in grafting on animals and on one man. These transplants grew well but continued to have a slick, velvety surface.—*Sci. News Letter* (Nov. 23, 1957): 329.

Sodium Diuresis Induced by a New Drug.—The adrenal cortex secretes a number of steroidal hormones which increase the tendency of the renal tubules to reabsorb sodium. Aldosterone, the most important one, promotes the conservation of sodium when it is deficient, but also is implicated in producing edematous states, such as congestive heart failure. The adrenal may also elaborate a sodium-losing hormone. Two synthetic sodium-losing steroids with an antagonism to aldosterone have been produced. They are particularly beneficial since they increase sodium excretion without affecting potassium levels.—*Science* (Nov. 15, 1957): 1016.

Congenital Virus Infections.—A case of intrauterine chicken pox in an infant is reported; also, smallpox, measles, and mumps have occurred within the first few days of life, indicating virus passage through the placenta. However, pregnant women have had chicken pox and other viral diseases without transmitting the disease to the fetus.—*Brit. Med. J.* (Nov. 2, 1957): 1063.

Peracute Frothy Bloat was quickly relieved in 15 sheep by giving silicones orally.—*Vet. Bull.* (Nov., 1957): Item 3357.

The Incidence of Anaplasmosis in Wyoming

GEORGE M. THOMAS, M.S.

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ANY PROGRAM for the control of anaplasmosis is dependent upon its recognition and concentration in an area. Until the development of the anaplasmosis complement-fixation test, this necessarily had to be based upon recognition of clinical cases and the detection of marginal bodies in the red blood cells of infected animals. With the development of the complement-fixation test, an entirely dependable survey tool has been made available. The test is reported to be 98 per cent accurate.²

Surveys to determine the incidence of anaplasmosis have been conducted in various states. During the last eight months of 1955 and first six months of 1956, a total of 8,500 cattle were tested in California, Missouri, Oregon, Tennessee, Virginia, and Washington.³ Of the total tested, 6,507 were negative, 243 suspect, and 1,788 reactors. The incidence of the disease ranged from no reactors in the state of Washington to 45.6 per cent in eastern Oregon. Tests were also reported in progress in the states of Maryland, Oklahoma, Kansas, and Montana. Of the 9,000 cattle tested for anaplasmosis in Montana, approximately 10 per cent were classified as reactors, and a slightly higher percentage designated as suspects.¹

MATERIALS AND METHODS

Blood samples used for anaplasmosis tests in this study were submitted to the Wyoming State Veterinary Laboratory, by veterinary practitioners, for the brucellosis-agglutination test during the period June, 1956, to April, 1957. After being tested for brucellosis, clear, nonhemolyzed samples were selected at random from each herd, and the serums preserved with 5 per cent phenol solution to a final concentration of 0.5 per cent.

The procedure of the complement-fixation test as used here³ is essentially the same as that used by the U.S.D.A. (BAI)

Mr. Thomas is associated with the Animal Disease Eradication Branch, Agricultural Research Service, U.S.D.A., Cheyenne, Wyo., where Dr. D. O. Manley is veterinarian in charge.

The author acknowledges the technical assistance and advice of Dr. J. F. Ryff, director of the Wyoming State Veterinary Laboratory, and the assistance of Mrs. Lois Salisbury for the preparation of serum samples.

for the diagnosis of dourine and glanders. Anaplasmosis antigen was supplied by the Animal Disease and Parasite Research Branch, Agricultural Research Service, Beltsville, Md. The readings were recorded as to degree of hemolysis with 4-plus indicating no hemolysis, 3-plus, 2-plus, and 1-plus indicating 25, 50, and 75 per cent hemolysis, respectively. Complete hemolysis was recorded as negative.

RESULTS

A total of 6,700 serum specimens from 388 Wyoming beef and dairy cattle were subjected to the anaplasmosis complement-fixation test (table 1). The serums represented cattle from 20 of the 23 counties in Wyoming (fig. 1). Of the 6,700 serums

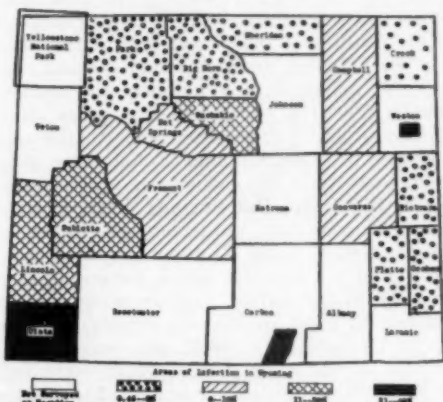


Fig. 1.—Distribution of positive anaplasmosis complement-fixation tests, June, 1956, to April, 1957.

tested, 702 (10.48%) were classified reactors, and 176 (2.62%) were designated suspicious.

DISCUSSION

The original objective of this study was to perform tests on a minimum of 1 per cent of the total cattle population in each county. This would have represented approximately 11,000 of the 1.1 million cattle and calves on Wyoming ranches. However, this goal could not be attained in all

TABLE 1—Anaplasmosis Complement-Fixation Tests Performed on Serums from Wyoming Counties
June, 1956, to April, 1957

County	Herds represented	Cattle tested	Reactors	Suspicious	Infections* (%)
Big Horn	63	822	21	15	4.38
Fremont	26	430	33	6	9.07
Hot Springs	16	331	20	0	6.04
Park	53	555	18	8	4.68
Washakie	17	248	45	4	19.76
Campbell	16	293	18	1	6.48
Crook	25	408	2	0	0.49
Johnson	—	—	—	—	—
Sheridan	24	410	11	4	3.66
Weston	1	43	11	2	30.23
Lincoln	75	1,151	109	23	11.47
Sublette	3	10	2	0	20.0
Teton	1	93	0	0	0
Uinta	8	979	360	113	48.31
Albany	3	76	1	0	1.36
Carbon	4	129	36	0	27.91
Natrona	—	—	—	—	—
Sweetwater	—	—	—	—	—
Converse	11	174	11	0	6.32
Goshute	11	47	2	0	4.26
Laramie	15	247	0	0	0
Niobrara	3	26	1	0	3.85
Platte	13	228	1	0	4.39
Totals	388	6,700	702	176	13.10

*Reactors and suspects.

counties because the number of blood samples received was regulated by the progress made with the brucellosis-testing program. As a result, less than 1 per cent of the cattle were tested from 14 counties and, in several instances, the number was inadequate. Positive tests, however, were disclosed in all of these counties with the exception of Laramie and Teton. One per cent or more of the cattle were represented from Big Horn, Hot Springs, Park, Washakie, Lincoln, and Uinta counties. No cattle were tested from Sweetwater, Natrona, and Johnson counties which have approximately 91,000 cattle, and anaplasmosis is known to exist in Johnson county.

In Uinta county, 48.31 per cent of 979 cattle in the eight herds tested were infected. These herds were scattered throughout the county, and only one of them had been known to be an anaplasmosis problem herd. No infection was found in the 247 cattle tested from 15 herds in Laramie County.

With an over-all percentage of 13.10 per cent infection for the state, anaplasmosis would appear to be state-wide and of considerable economic importance.

SUMMARY

Of a total of 6,700 serum samples representing 388 Wyoming beef and dairy cattle tested for anaplasmosis, 702 (10.48%) were classified as reactors, and 176 (2.62%) as suspicious.

Positive tests ranging from 0.49 to 48.31 per cent were obtained from cattle in 18 of the 20 counties surveyed.

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Virus Infection and Congenital Malformation.—Rubella (German measles) infection during the first trimester of pregnancy was once believed to cause congenital malformation of 50 to 100 per cent of live-born infants. More recent investigation shows this to be excessive. Of 46 women thus infected, fetal deaths occurred in 12 (26.1%), there were three stillbirths (6.52%), three congenitally defective infants (6.52%), and 28 normal children (61%).—*J. Am.M.A. (Oct. 12, 1957): 675 and 688.*

Chemotherapeutic Control of Experimental Babesial and Anaplasma Infections in Cattle in Brazil

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THE SOUTH AMERICAN cattle disease commonly called "tristeza" has been studied by Esquibel,¹⁰ in Brazil, and Lignère,⁷ in Argentina. It is an acute or chronic infectious disease, being actually a mixed infection of both babesias and anaplasmosis. The erythrocytes contain bodies of the infective agents *Babesia bigemina*, *Babesia argentina*, and *Anaplasma marginale*, which are transmitted by the tick vector *Boophilus microplus*. Imported cattle and their progeny are especially susceptible.

In Brazil, a successful program for the protection of imported cattle susceptible to both diseases has been to give the animals, while they are in quarantine, a subcutaneous injection of blood from an animal carrying all three agents. The inoculated animals are subsequently observed for febrile reactions and appearance of parasites in the erythrocytes, which usually occurs in eight to 11 days for *Babesia*, and in 21 to 38 days for *Anaplasma*. As soon as the first febrile reaction is observed, the animals are usually treated with parasitocides such as Acaprin, acriflavine, or trypan blue. The temperature usually returns to normal, but the infection is not completely destroyed and the animals become immune carriers. They are then challenged with infected ticks carrying the agents of babesias and anaplasmosis. If found free of any clinical manifestations of "tristeza" for one month, they are released.

The drugs mentioned, which have been used in the past for chemotherapeutic control of babesias during premunition, have a number of disadvantages. Some produce phlebitis, liver damage, and sometimes photosensitivity, whereas others produce undue side effects, due mostly to parasympathetic stimulation which necessitates the simultaneous use of other drugs. Still others result in discoloration of muscle

tissue so that, after slaughtering, the meat shows an undesirable bluish tint.

A new chemotherapeutic agent, p,p'-diguanyl-diazoamino-benzene (Ganaseg[®]), is used in the treatment of trypanosomiasis and babesias but is ineffective against anaplasmosis. Studies conducted in Africa¹ have shown the efficacy of a single intramuscular injection (1-3 mg./kg. of body wt.) of this drug. There was no undue reaction.

Investigations in the United States^{2-4,5,6,8} have shown that relatively large doses (50-100 mg./kg.) of the broad-spectrum antibiotics, chlortetracycline (Aureomycin), oxytetracycline (Terramycin), and tetracycline, could result in complete elimination of the carrier state of anaplasmosis in cattle. Since resistance against anaplasmosis is based on survival of some parasites in the treated animal, it was decided to test tetracycline at relatively small doses (2-5 mg./kg.) for controlling the febrile reactions which are often followed by more severe, though less frequent, complications during premunition. It had been reported⁹ that small doses of oxytetracycline (0.5-6.0 mg./kg.) were useful during the course of premunition against bovine anaplasmosis in Brazil. The object of this study, therefore, was to test the efficacy of p, p'-diguanyl-diazoamino-benzene and small doses of tetracycline hydrochloride (Stectin[®]), respectively, in the chemotherapeutic control of experimental babesial and anaplasma infections, as produced during premunition of susceptible cattle in Brazil.

METHODS

The study was conducted at the São Paulo Agua Branca quarantine station during routine premunition of imported cattle. No untreated controls were available and, therefore, negative results in fever control at low drug dosage levels have to be considered as controls in the described experiments. The animals used were all imported pregnant cows of the Holstein type. They were infected by sub-

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[®]Ganaseg is produced by Squibb, New York, N. Y. It is a yellow, amorphous, granular, synthetic chemical, soluble in water.

[®]Stectin is produced by Squibb, New York, N. Y.

cutaneous injection of 5 cc. of blood from an old, constantly tick-infected carrier, which showed positive smears for *B. bigemina*, *B. argentina*, and *A. marginale* (Giemsa stain). The inoculated animals were kept in individual tick-free stalls. Rectal temperatures were taken twice daily. After an incubation period of eight to 11 days, the temperature generally rose, accompanied by the appearance of *Babesia* in the erythrocytes. When the temperature reached 39.5 C. (103.1 F.) and more than 3 per cent of the erythrocytes were infected, intramuscular injections with the diguanyl-benzene compound (7% aqueous suspension) were commenced. The return of the temperature to 39.5 C. or less within 24 hours was considered a criterion of successful treatment. If this did not occur, the animals were treated again.

Usually, 21 to 38 days after experimental infection, the same animals showed a second rise of temperature due to an increase of *A. marginale*.

General weakness and lack of appetite also occurred. The criterion used for beginning the treatment with tetracycline hydrochloride was a temperature of 40 C. and at least 3 per cent of the erythrocytes showing *Anaplasma*. The return of temperature to 39.5 C. or less within 48 hours, with no temperature rise for five days thereafter, was presumed to indicate successful treatment.

One week after the normal body temperature was re-established, all animals were infected with *B. microplus* carrying *B. bigemina*, *B. argentina*, and *A. marginale*, and kept under observation for at least four weeks. Three normal control animals were used to demonstrate the presence of virulent *Babesia* and *Anaplasma* in the ticks used for the challenge.

RESULTS AND DISCUSSION

Babesiosis.—An orienting experiment was conducted to establish the minimal

TABLE I—Use of Ganaseg During Premunition Against Babesiosis

Animal No.*	Weight (kg.)	Months pregnant (approx.)	Days between infection and treatment	Days between infection and return to normal temp.	Dose (mg./kg., i.m.)	Repeated treatment dose (mg./kg., i.m.)	Recovery after first treatment (group %)
3	300	6	9	11	1.0	—	37.5
4	300	5	10	13		2.0	
5	310	4	11	12		—	
6	300	7	9	10		—	
9	380	5	9	11		2.0	
10	390	5	9	11		2.0	
16	350	6	9	11		2.0	
42	400	4	10	13		2.0	
38	380	4	9	11	1.5	—	75.0
35	380	6	9	10		—	
21	390	5	10	13		1.5	
14	380	4	9	11		—	
28	420	6	9	11		—	
20	380	5	9	11		1.5	
11	380	5	9	10		—	
44	400	4	9	11		—	
51	360	5	9	11	2.0	—	100.0
27	380	4	9	10		—	
26	400	5	8	10		—	
25	400	6	8	10		—	
23	380	6	9	11		—	
22	390	6	9	12		—	
18	350	6	10	11		—	
7	380	7	9	12	2.5	—	100.0
8	350	5	9	10		—	
47	420	5	10	13		—	
13	400	5	9	11		—	
46	420	5	9	11		—	
53	400	4	10	12		—	
50	450	6	9	11		—	
40	390	4	8	11	3.0	—	100.0
39	390	4	9	11		—	
43	400	4	9	11		—	
45	400	4	9	11		—	
49	450	5	9	10		—	
12	380	4	8	10		—	
15	400	5	8	10		—	
17	350	6	11	12	3.0	—	100.0
24	400	5	8	10		—	
48	400	5	9	10		—	
41	400	6	9	10		—	
29	380	5	8	10		—	
34	400	4	10	11		—	
37	300	5	9	10		—	

*Animals without febrile reaction and *Babesia* counts below 3 per cent (No. 19, 36, 52) not included.

effective dose of the diguanyl-benzene drug under existing conditions. Single animals were injected intramuscularly with 0.75 mg./kg., 2 mg./kg., 3 mg./kg., and 5 mg./kg., respectively. Under conditions of the final test, the 2 mg./kg. dose appeared the minimal dose which would insure elimination of fever. One animal was given four intramuscular injections of 2 mg./kg. for four days without any toxic reactions. The results obtained are summarized (table 1).

As indicated, no febrile reactions were observed in 3 animals, so they were given no chemotherapeutic treatment. All 3 showed positive blood smears for babesiasis and anaplasmosis and were later resistant to the tick challenge test. Therefore, the premunition in these cases can be considered ideal. All of the 44 remaining cows had febrile reactions accompanied by presence of *Babesia* in the erythrocytes,

an average of 9.1 days (8 to 11) after the injection of blood from the immune carrier.

Of 8 cows given 1.0 mg./kg. of the drug, the fever reaction was eliminated in 3 (37.5%), whereas 5 had to be treated again with 2.0 mg./kg. With the 1.5 mg./kg.-dose, the fever was eliminated in 6 of 8 cows (75%), while 2 needed re-treatment. In the second treatment, 1.5 mg./kg. of the drug was used so that in both groups the animals which needed repeated treatment received a total of 3.0 mg./kg. p,p'-diguanyl-diazoamino-benzene. In the groups of animals given 2.0, 2.5, and 3.0 mg./kg. of the drug, respectively, the febrile reaction was eliminated in all, within 24 hours. All of the 47 cows were four to seven months pregnant when this study was started, yet none aborted.

Anaplasmosis.—The results obtained in the tetracycline treatment of the disease

TABLE 2—Use of Tetracycline During Premunition Against Anaplasmosis

Animal No.*	Days between infection and treatment	Days between infection and return to normal temp.	Tetracycline dose (mg./kg.) and route	Repeated treatment dose (mg./kg.) and route	Elimination of fever after first treatment (group %)
6	34	38		2.5 i.v.**	
43	30	35		2.5 i.v.	
28	22	31		2.5 i.v.	
37	28	31		.....
27	21	25	2.5 i.m.**	.....	62.5
25	27	32		.....
42	31	32		.....
13	37	39		.....
4	23	26		.....
22	29	30		.....
49	32	35		.....
14	33	37	5.0 i.m.	.....	100.0
44	36	39		.....
39	21	23		.....
38	22	23		.....
21	22	23		.....
11	26	29	7.0 i.m.	.....	100.0
50	21	26		.....
46	24	27		.....
26	31	37		2.5 i.v.	
15	26	31		.....
9	33	39		.....
29	28	29	12.5 oral	.....	66.7
41	34	39		.....
24†	24	34		7.0 i.m.-2.5 i.v.	
48	34	40		2.5 i.v.	
18	38	40		.....
16	37	39		.....
5	35	38		.....
3	33	34		.....
10	37	39		.....
23	37	39		.....
8	31	33	2.5 i.v.	.....	100.0
40	38	40		.....
12	36	39		.....
52	37	39		.....
7	35	39		.....
51	32	34		.....

*Animals without febrile reaction and Anaplasma counts below 3 per cent (No. 17, 19, 20, 34, 35, 36, 45, 47, and 53) not included; **i.m. = intramuscular; i.v. = intravenous.

†Excluded from evaluation due to complications and insufficient information.

occurring from infection with *A. marginale*, in the same cattle which previously had reacted to babesiasis and had been treated with the benzene compound, are shown (table 2).

Of the 47 cows, the 9 which had no febrile reaction and showed blood counts of *Anaplasma* less than 3 per cent were not treated with tetracycline. They were challenged with ticks at the same time as the drug-treated animals and showed complete resistance. This might indicate a relatively low virulence of the *Anaplasma* of the carrier, or a high degree of resistance of some of the animals. Cows 19 and 36 had also failed to show clinical reactions to the babesial infection. All of the remaining 38 cows had febrile reactions accompanied by the presence of *Anaplasma* in the erythrocytes, an average of 30.4 days (21 to 38) after being given the injection of blood from the immune carrier.

Fever was eliminated in all 12 cows injected intravenously with 2.5 mg./kg. of tetracycline hydrochloride, but in only 5 of 8 animals (62.5%) when the same amount was given intramuscularly. In the other 3 cows, the temperature rose again to 40 C. within three to eight days after the first intramuscular injection, accompanied by a rise in *Anaplasma* counts; they were again given 2.5 mg./kg. intravenously. When doses of 5.0 and 7.0 mg./kg. of tetracycline hydrochloride were given intramuscularly, fever was eliminated from all 11 cows.

With doses of 2.5 mg./kg. of tetracycline, there were no undue reactions whereas, with the larger intramuscular doses, edema developed at the site of injection. This might have been due to the use, in relatively superficial intramuscular injections, of concentrations of tetracycline hydrochloride (pH 2.5) higher than 5 per cent. Therefore, when using more than 2.5 mg./kg., it would be preferable to inject the drug in different sites.

Of 6 cows treated orally with 12.5 mg./kg. of tetracycline, 4 (66.7%) showed elimination of fever, whereas 2 needed 2.5 mg./kg., intravenously, to normalize the temperature. Cow 24, which was given 12.5 mg./kg. tetracycline orally, showed a temperature of 38.9 C. 48 hours after treatment. When her temperature again rose to 40.5 C. 48 hours later, she was given 7 mg./kg. intramuscularly. Her temperature remained elevated, so another 2.5

mg./kg. was given intravenously. She then aborted and, after another 48 hours, the temperature returned to normal. Due to this complication, this animal was excluded in the final evaluation of data.

The data seem to indicate that the use of 2 to 3 mg./kg. of p,p'-diguanyl-diazo-amino-benzene, intramuscularly, and 2.5 mg./kg. of tetracycline hydrochloride, intravenously, can serve as effective and practical therapy to control the undesirable clinical reactions which frequently occur in Brazil during the course of premunition in susceptible imported cattle against babesiasis and anaplasmosis.

SUMMARY

1) The minimal effective single dose of p,p'-diguanyl-diazoamino-benzene (Gana-seg), which resulted in 100 per cent elimination of the clinical manifestations of babesiasis in cattle, was 2.0 mg. per kilogram of body weight, given intramuscularly. None of the doses employed cleared the blood of *Babesia bigemina* and *Babesia argentina* completely.

2) Of 47 imported cows, 4 to 7 months pregnant, experimentally infected with *B. bigemina*, *B. argentina*, and *Anaplasma marginale* during the course of premunition, babesiasis appeared at an average of 9.1 days, anaplasmosis at 30.4 days, each indicated by a fever. The babesiasis was treated with the benzene compound; the anaplasmosis with tetracycline. No cow aborted after the first treatment.

3) Tetracycline hydrochloride (Steclin), 2.5 mg./kg. given intravenously, resulted in 100 per cent elimination of fever without any undue reactions. When given intramuscularly, 2.5 mg./kg. resulted in 62.5 per cent, whereas 5.0 and 7.0 mg./kg. resulted in 100 per cent elimination of fever. The larger doses produced edema at the site of injection. Doses of 12.5 mg./kg., given orally, eliminated fever in 66.7 per cent of the treated animals without any apparent ill effect.

4) The animals thus treated showed complete immunity against reinfection when exposed to ticks carrying *B. bigemina*, *B. argentina*, and *A. marginale*.

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Radiological Hazards to Veterinarians

Chronic exposure to ionizing radiation from low-voltage sources is known to produce damage to living tissue. The occupational exposures resulting in damage among physicians, dentists, medical fluoroscopists, and operators of shoe-fitting machines is known. The extent of occupational exposure to veterinarians was not definitely known until this survey.

There are 193 registered veterinary establishments employing about 300 persons in the New York metropolitan area. In 60 of these establishments, selected at random, a study was conducted on 74 veterinarians, six assistants, and one kennelman whose work was almost entirely with household pets. Of this group, 30 veterinarians performed radiography only, 14 did fluoroscopy only, 29 did both, and 8 did no x-ray work.

Protective equipment, such as leaded rubber gloves and aprons, were available for 66 of the persons occupationally exposed to radiation but frequently they were in poor condition and seldom were they used consistently. No lead control panels or other metal shielding designed to protect workers, such as the operator of

the machine or the holder of the animal, were used anywhere. In most places, during radiography the animal was strapped down or held by an assistant or by the owner. The assistant was, thereby, exposed to the higher-intensity scatter rays near the beam and, at times, inadvertently to the beam itself. The veterinarian usually operated the machine and, thus, was farther away from the rays but, because of generally limited working space, it was found that he still received considerable radiation.

Veterinarians engaged only in radiography usually use machines operating at a fixed voltage and current which produce x rays of stable quality and intensity, only the time factor being variable. Such users were predominantly recent graduates or older practitioners who had sustained previous damage. Those using the fluoroscope regularly were found to expose their torsos to high-intensity scatter rays and their hands, forearms, and eyes to the primary beams for appreciable periods. No veterinarian budgeted the radiological work-load to limit his exposure. Although many expressed knowledge of the possible hazard, the working habits of most did not reveal any practical appreciation of the risk.

The survey of one third of the veterinary establishments in the greater New York metropolitan area revealed the existence of a potentially hazardous condition in a considerable proportion of the establishments. Actual damage from radiation had occurred to some veterinarians. Fluoroscopy presents greater hazards than radiography and is more extensively used.

It is recommended by those making this survey that the x-ray unit used for veterinary purposes be of modern design and maintained in good repair. The cone should be adequate but small enough to occupy the smallest possible area. Low-energy rays should be eliminated from the primary beam by metal disc filters and the working areas should be shielded to minimize scatter. Radiography should supplant fluoroscopy wherever possible. Shielding should be employed to protect the operator, and animals should be anesthetized and strapped in place in preference to being held. Personnel should be rotated wherever the weekly exposure is in excess of 75 mr. —Abrahams et al. in *A.M.A. Arch. Indust. Health*, 14, (1956): 521.

Comments on Veterinary Practices by a Laymen's Advisory Committee

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AWARENESS of the increasing importance of good veterinarian-client relations has led the Michigan Veterinary Medical Association to take a major step toward keeping its professional finger on the pulse of public attitudes toward veterinary practitioners.

To accomplish this, the president of the Michigan V.M.A. appointed a Citizens' Advisory Committee, the first such lay group in the 75-year history of the association. After considerable study, a committee of three lay persons from various professions were selected, persons who had been in contact with veterinarians as clients, as co-workers in community service, or in other activities.

The committee was asked to advise the association on matters affecting the various areas represented by the members to help the association determine public opinion regarding the veterinarian, and to coldly and analytically point out the errors, fallacies, and sins of omission or commission of the veterinary profession.

The three persons selected to serve on the committee were a dog breeder, a managing director of a humane society, and a dairy farmer. The dog breeder, like the other two members of the committee, utilizes veterinary service regularly. He does not diagnose or treat diseases in his own dogs or in the pups that he sells. He refers his customers to some ten or 12 veterinarians in a large metropolitan area, on the basis of location of the residence of his customer. The managing director of the humane society has, for many years, come in contact with literally hundreds of veterinarians. The dairy farmer also utilizes veterinary service regularly.

At the first meeting of the Advisory Committee, attended by the three lay members, the president, vice-president, and executive secretary of the Michigan V.M.A., the lay members were fully apprised of the purpose of the committee. They were

asked to freely criticize the veterinary profession in all of its phases.

The following items were gleaned from this first meeting:

- 1) Nothing disgusts a client so much as to enter a dirty, cluttered, poorly lighted waiting room.
- 2) A dirty, ill-smelling hospital warrants only one visit by the average discerning client.
- 3) A shabby, unshaven veterinarian with dirty hands and nails does not inspire confidence.
- 4) "Passing the buck" to an assistant is merely another way of admitting that you don't know how to conduct your practice.
- 5) An assistant should not over-sell services; the client may feel that the assistant is only trying to justify his salary.
- 6) Honesty at the time of diagnosis is sincerely appreciated. Humane societies receive many complaints that "the vet has kept them coming when the animal should have been put to sleep on the first visit."
- 7) Cats should be accepted as patients. Many veterinarians either refuse to treat, or at best half-treat, a sick cat. Cat owners are a group unlike any other group in the world—they are your biggest boosters or your worst enemies.
- 8) Tact and diplomacy at the time of the death of an animal is one of the most important customer contacts which you have. A harsh, cold attitude engenders dislike and subsequent poor advertising. The veterinarian should take the time to explain the probable or possible cause of death in simple, understandable terms.
- 9) Many persons in need of veterinary services shop for prices by telephone. A wide divergence in fees completely confuses the client. The committee strongly advised a standardization of fees, or the veterinarian should only quote fees for standard services such as rabies immunization, distemper and hepatitis protection, and simple, uncomplicated ovarietomies.
- 10) Some provision should be made on an area basis for availability of the veterinarian for house calls. It was suggested that a veterinarians' telephone exchange should be considered.
- 11) The farmer member of the committee indicated that the veterinarian increased his prestige by dispensing drugs, standard remedies, and feed additives from his office. The farmer would rather go to the veterinarian's office for his stock remedies than patronize the druggist or feedstore.
- 12) The general observation of all three of the committee members was that people are more intelligent today, and it behooves the veterinarian to keep abreast of the times. He must be able to converse intelligently with his client on all of the

Dr. Willson is executive secretary and Dr. Kelly is president of the Michigan Veterinary Medical Association.

newer advances in the field of medicine. It was also suggested that the local veterinarian should take part in community services, such as the grange, 4-H clubs, service clubs, and community chest drives.

The authors recognize that it is too early to attempt to draw any clear-cut conclusions from the results of the first meeting of the committee; however, there is certainly an indication that formation of such a committee is worthwhile. If the committee will help keep our professional heads out of the sand by focusing attention on our common sins and omissions, much will be accomplished. If we are making mistakes and entertaining false impressions of client attitudes, we should recognize these faults and attempt to correct them.

Hereditary Ataxia in Smooth-Haired Fox Terriers.—During the last 15 years, a locomotory disturbance characterized by ataxia has been observed in some strains of Smooth-Haired Fox Terriers in Sweden. Affected dogs usually show the first signs at about 4 months of age and gradually become worse until they have great difficulty in moving. It is advisable to destroy affected dogs.

Pedigrees of animals known to carry this gene have been examined and the probable frequency of the condition has been calculated. Cases of ataxia must be carefully investigated because of the possibility that factors such as distemper, feeding, trauma, parasite infestation, and toxic agents might be involved. Since ataxia in Smooth-Haired Terriers is hereditary, a systematic elimination of the responsible gene should be undertaken.—*G. Björk et al. in Vet. Rec., 69, (Sept. 14, 1957): 871.*

Pulmonary Adenomatosis in Man.—Pulmonary adenomatosis is characterized by large intrapulmonary nodules of epithelial alveolar cells which merge into a tumor and give rise to metastases. Bronchorrhoea appears only in typical bilateral form with expectoration of a foamy, watery, transparent fluid, 300 to 3,300 cc. daily. Later, the fluid becomes purulent and finally hemorrhagic. Six cases are reported from Uruguay. The three men with bilateral involvement died of asphyxia; necropsies showed large numbers of metastases in several viscera and metaplasia of the muciparous alveolar cells. The three cases in

women were unilateral and two of these were subclinical.—*J. Am. M. A. (Oct. 12, 1957): 741.*

Radiographs of Intervertebral Disks (Diskography).—A method of direct visualization of intervertebral disk in man, by injection of contrast medium into the substance of the disk, is reported in 508 disks in 254 patients. Since it yields positive evidence rather than the indirect evidence from myelography, it seems to be a more accurate diagnostic test.—*New England J. Med. (July 4, 1957): 6.*

Dogs and Fatty Acid Odors.—Dogs trained to pursue a man by his scent lose interest when butyric or other similar acids, which give off an odor of decaying animal tissue, are placed in their path. The dogs stop, roll, rub shoulders on the spot, and abandon the pursuit. These odors are disagreeable to man but dogs evidently find them interesting.—*Sci. News Letter (Sept. 28, 1957): 200.*

The Dairymen's Fertilizer Cooperative, Inc., in Los Angeles County, Calif., has launched a plan under which every stockholder's corrals will be cleaned at regular intervals of 21 days and the manure stockpiled until sold for fertilizer. It is estimated that the 105,000 cows in the county would produce about 1.2 million cubic yards of manure a year which, if placed on a football field, would cover it to a depth of over 600 feet. The disposal problem is the result of the disappearance of thousands of acres of truck crops and orchards due to the influx of suburbs and industries. The profits from the fertilizer are expected to defray all costs, and the frequent yard cleaning should control flies and reduce losses from mastitis and foot infections in cows.—*West. Dai. J. (Sept., 1957): 21.*

Acute Mesenteric Lymphadenitis.—Emergency laparotomy on 500 patients (83 children), suspected of having acute appendicitis, revealed acute mesenteric lymphadenitis in six children under 14 years of age. Each suffered acute abdominal pain, vomiting or diarrhea, high fever, and marked leukocytosis. Histologically, the enlarged nodes showed hyperplastic lymphadenitis.—*J. Am. M. A. (Nov. 9, 1957): 1330.*

Surgery and Obstetrics

and Problems of Breeding

Technique of Preparing Frozen Semen

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THE TECHNIQUE of freezing semen was first developed in England, and our organization became interested in it due to the potential increased service that we could render to our members through its use.

We started freezing semen for the first time early in 1953. In February, 1954, we started our first technician on the 100 per cent use of frozen semen. Other technicians were started during the latter part of 1954 and we have continued to change until all of our technicians are now using only frozen semen. At the beginning, the rate of conception with frozen semen was somewhat lower than that with liquid semen, but we were able to improve our techniques of freezing and storing until today our rate of conception is as high, if not higher, than it was with liquid semen.

MATERIALS AND METHODS

After the semen is collected, it is examined to determine the total number of living sperm cells per cubic centimeter. This is accomplished by the use of the photometer and a microscopic study of diluted semen to count the individual sperm cells that are moving, abnormal, or dead in each field. The semen is then diluted so that the quantity to breed 1 cow contains at least 20 million sperm. It is then placed in an ampule to be frozen.

First of all, the semen is diluted with 50 per cent of the diluting material, which contains antibiotics, and is allowed to stand in a cold room at a temperature of 41 F. for about six hours. The dilution is then continued, with the remainder of the diluting material containing sufficient glycerin to make 7.5 per cent of the total diluting material.

The diluting material containing the glycerin must be added slowly because glycerin is toxic to the sperm. To accomplish this, the diluted semen is placed on an oscillating table and the diluting material containing the glycerin is placed in a separatory funnel on a rack above the

semen. With the table shaking gently, the diluting material is allowed to pass into the diluted semen 1 drop at a time. This requires about 45 minutes.

The diluted semen is allowed to stand for 12 to 14 hours and is then placed in the container in which it will be frozen.

Two types of containers are being used—glass, of various types, and plastic ampules. More semen is being frozen in glass, I believe, than in plastic containers.

We are using glass ampules on which a labeling machine prints the bull's registered name and number, after which they go into an oven to be baked at 400 F. for 30 minutes. A Popper ampule filling-and-sealing machine then fills and seals the ampules at the rate of 60 a minute.

The ampules are placed on trays, which hold 20 ampules each; they are then placed in the automatic freezing machine.*

This machine has an alcohol bath which is cooled to 41 F.—the same temperature as the cold room—so there will be no change in temperature when the trays of ampules are removed from the cold room and placed in the alcohol bath. The machine is connected by pipe to a tank of liquid CO₂. The machine also has a small electric motor which runs a small propeller to keep the alcohol constantly circulating around the ampules. The machine has a cam with a little rotary on the edge which automatically controls the amount of CO₂ entering the alcohol tank. We are thus able to maintain a constant rate of freezing and to have the temperature drop from 41 F. to -70 F. in a matter of 35 minutes. The machine is then disconnected, from both the electric current and the tank of liquid CO₂, and is pushed into the mechanical storage unit where the trays are transferred into a box that maintains a temperature of -118 F. The final stage of the freezing takes place in this box.

DISCUSSION

Frozen semen is a boon to the dairy industry, making it much easier for a dairyman to carry on a breeding program

*Presented before the General Session, Ninety-Fourth Annual Meeting, American Veterinary Medical Association, Cleveland, Ohio, Aug. 19-22, 1957.
*Mr. Kellogg is general manager, Central Ohio Breeding Association, Columbus.

*Purchased from Frozen Semen Products, Inc., Bala Cynwyd, Pa.

through an artificial breeding association. It has made it possible to use semen for a year or two after death of the bull.

Many dairymen today are freezing semen from their herd sires and using it as an insurance policy in case of sterility or death of the bull. Others are using the frozen semen program with their own bulls to make it possible to continue breeding while the bulls are on the show circuit.

We have attempted to cooperate with breeders of both dairy and beef cattle through a custom semen-freezing program so they can have frozen semen available. While the technique of freezing semen is not difficult, it is a program that must be handled carefully. One must have the right kind of equipment to assure the high quality of semen needed to give good rates of conception.

There are many different means of storing frozen semen, such as dry ice, mechanical and dry ice, mechanical and liquid nitrogen. As far as we know, it is absolutely necessary to have the temperature at least -100°F . to maintain semen of good quality. Whether lower temperatures will maintain a higher quality of semen for a long period remains to be proved.

Transportation and Fertility of Bulls.—No evidence of reduced fertility, caused by the transportation of 36 bulls, was previously reported. Additional studies of 60 mature bulls of six breeds confirms the original finding. The average nonreturn rates of the 60 bulls was 70.7 per cent during the month before transportation and 70.3 per cent during the month after being transported distances of 300 to 2,000 miles by train, truck, or airplane without use of suspensory supports for the scrotum.—*J. Dai. Sci. (Oct., 1957): 1367.*

Maintaining Pregnancy in Ovariectomized Ewes with Hormone Injections.—Because of the many embryonic deaths in the first 18 days of pregnancy in ewes, 49 ewes at the University of Wisconsin were bilaterally castrated 84 hours after breeding and were given various hormone injections daily until slaughtered on day 25. Of 14 ewes given 1 or 2 mg. of progesterone plus 0.01 or 0.02 mg. of estradiol daily, none were found pregnant; of 14 given only the progesterone, 4 (28%) were

pregnant; of 21 given 1.0 mg. of progesterone plus 0.25 μg . of estrone, 14 (67%) were pregnant; and of 18 uncastrated and untreated control ewes, 14 (78%) were pregnant. Twins were present in 8 controls and in no treated ewes. The weight of the embryo in ewes given progesterone and estrone was, unexpectedly, significantly heavier than those of untreated ewes.—*J. Anim. Sci. (Nov., 1957): 986.*

Time of Placentation in the Cow.—In a study of the uteri of 28 dairy cows, at Kansas State College, there were no placental attachments at 27 days of gestation. Between days 31 and 34, the chorioallantois nearly filled the pregnant horn and caruncles were being formed on it by the pressure of enlarged loops of uterine capillaries. Firm cotyledons with interlocking septa and villi were produced by day 38. As the membrane extended into the non-pregnant horn, cotyledons continued to develop until about the ninetieth day of gestation.—*J. Anim. Sci. (Nov., 1957): 1043.*

Effect of Stilbestrol on Shoats

When stilbestrol pellets were implanted subcutaneously in the ears of 136 shoats, in doses ranging from 30 to 60 mg., effects on the genital organs were visible in one or two days. The vulvas became edematous and hyperemic, the teats in both barrows and gilts were enlarged (3 times heavier), and sexual activity was increased. The hyperemia of the vulvas regressed in a month but they remained enlarged. One barrow had a mild rectal prolapse nine days after implantation.

At slaughter, the ovaries of controlled gilts averaged 4.15 Gm., while those of treated gilts were either enlarged and cystic (av. 48.0 Gm.) or atrophied (av. 1.03 Gm.). Enlarged ovaries contained no corpora lutea but the follicles often were 1.5 to 3.0 cm. in diameter. The seminal vesicles of treated barrows averaged 20.3 Gm., compared with 1.3 Gm. in controls. The treated shoats gained more slowly (1.40 vs. 1.54 lb. daily) but required slightly less feed per pound of gain than did controls. The back fat was significantly less, and the loin and ham density slightly greater in the treated shoats.—*J. Anim. Sci. (Nov., 1957): 901.*

Clinical Data

Some Effects of Hygromycin on Early Natural Infections of *Ascaris Lumbricoides* in Swine

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MOST SWINE ANTHELMINTICS are directed toward the removal of ascarids after they have made their migration through the liver and lungs and have returned to the intestine to mature. However, much damage is done during the migratory phase of the infection, as shown by liver lesions, verminous pneumonia, and failure to gain properly. An anthelmintic which would stop this infection prior to migration of larvae, if widely used, could practically eliminate ascarid disease.

In experiments with mice, the migratory phase of *Ascaris lumbricoides* was prevented with high doses of piperazine-HCl.¹ However, continuous low levels of a piperazine complex failed to produce the same effect in swine infected experimentally and naturally.^{2,3}

Hygromycin B was reported to be effective against certain nematodes of swine.^{2,6} Therefore, it seemed worthwhile to investigate the potential value of hygromycin B against the migratory phase of *A. lumbricoides* and, at the same time, record weight gains of naturally infected pigs, with and without hygromycin B, compared to worm-free pigs without the antibiotic.

MATERIALS AND METHODS

The drug used was hygromycin B (Hygromix®), containing 2,400,000 units of hygromycin B per pound. It was used at the level of 5 lb. per ton of complete swine starter ration, mixed into a premix in a "small batch" mixer, and then further mixed for 15 minutes in a 1-ton capacity commercial spiral mixer. The hygromycin B feed was all mixed at one time in a 1,000-lb. lot.

Fifteen pigs, 9 Chester Whites and 6 Duroc Jerseys, were taken soon after farrowing from the litters of 4 scrubbed sows. They were raised in screen cages and fed a synthetic diet. In the past five years, neither liver scars nor worms were ever demonstrated in more than 20 pigs from this source used as ascarid-free controls in experiments.

At the beginning of this experiment, the pigs

were about 7 weeks old. Ten of the 15 pigs were confined in a thoroughly disinfected tiled room with a concrete floor, and were fed the normal starter ration from new metal self-feeders. After 13 days, 5 of the pigs were moved to the west experimental infective lot and continued on normal starter ration throughout the experiment. The other 5 were left in the same room on the normal ration and served as controls.

The third group of 5 pigs was confined in a similarly prepared room but were fed the hygromycin B mixed feed for 13 days prior to being moved to the east experimental infective lot where they continued on the antibiotic mixed feed.

One pig from each group was killed by electricity at approximately weekly intervals. Each was opened and its viscera were examined and removed to a refrigerator. The livers were photographed as soon as practicable. The contents of the small intestine were screened, through a combination of 40- and 60-mesh brass screens, and the material collected was flushed into large, clear glass casserole dishes. This material was carefully examined, using a probe over a transilluminator, for tiny early *Ascaris* larvae as well as for larger worms.

The infective pastures used, 1/8 acre each, were separated by a fence. Shelter was provided in the east pasture by a small building, in the west pasture by a group of trees and bushes. During the experiment, there were several hard rains and temperatures varied from 60 F. at night to over 90 F. during several days. New metal feeders and clean waterers were used in both pastures.

RESULTS AND DISCUSSION

It was recently reported² that migratory ascarid larvae reach the liver within two days. In the present work, visible liver scars occurred sometime during the second week of infection. In the present experiment (table 1 and fig. 1-15), the control pigs had neither liver scars nor worms and the heaviest liver scarring occurred in pigs fed hygromycin B. (The liver of pig 18-1 (fig. 5) contained some scars but they do not show.) The addition of hygromycin B to the feed did not inhibit the migratory phase of swine ascarids.

The worms recovered from the pigs fed hygromycin B (table 1) were intact and in every respect were like those from the pastured pigs on normal feed. It is impossible to say whether the hygromycin

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Journal article 2116, Michigan Agricultural Experiment Station, East Lansing.

Appreciation is due to Mr. John Greve, whose work made this experiment possible.

*Supplied through courtesy of the Eli Lilly Co., Indianapolis, Ind.

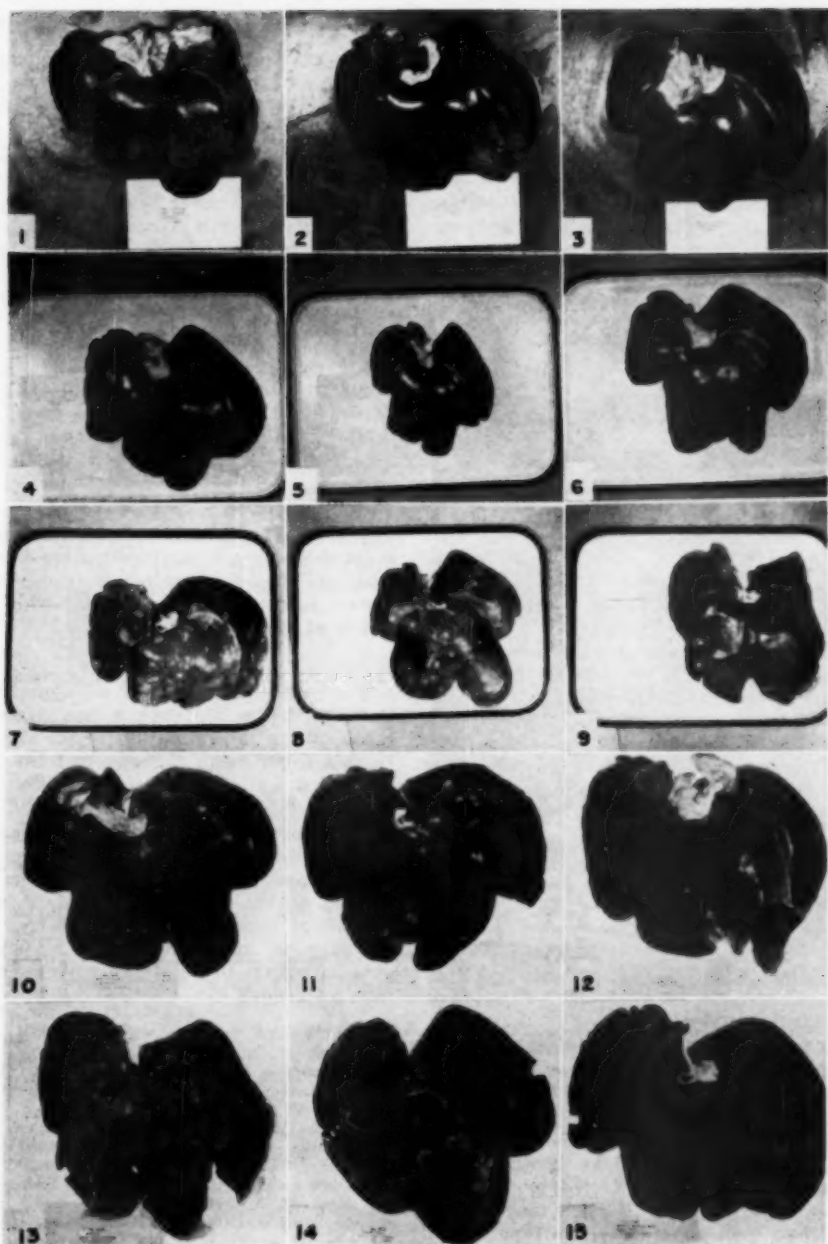


Fig. 1, 4, 7, 10, and 13—Livers from pigs from east pasture on hygromycin feed after one, two, three, four, and five weeks on infective pasture, respectively.

Fig. 2, 5, 8, 11, and 14—Livers from pigs from west pasture on normal feed after one, two, three, four, and five weeks on infective pasture, respectively.

Fig. 3, 6, 9, 12, and 15—Livers from uninfected pigs fed normal feed and raised indoors on concrete after one, two, three, four, and five weeks, respectively.

TABLE 1—Effect of Continuous Hygromycin Feeding on Natural *Ascaris Lumbricoides* Infections in Pigs

Approx. weeks on pasture		1	2	3	4	5				
Dates	5/27	6/8	6/13	6/20	7/1	7/9	7/15			
Pig weight										
Pig No.	Initial	To pasture	At slaughter				Liver scars	Worms recov.	Total gain per group (lb.)	
East pasture (hygromycin group)										
19-4	24	38	41*	----	----	----	0	0	202	
18-9	27	41	----	58*	----	----	+	0		
11-7	29	41	----	----	75*	----	+	197		
19-1	28	40	----	----	70	83*	+	2		
**18-2	25	33	----	----	60	73	76*	+		0
West pasture group										
**10-8	21	32	36*	----	----	----	0	0	181	
18-1	18	25	----	32*	----	----	+	0		
**19-7	24	40	----	----	68*	----	+	25		
11-2	25	36	----	----	72	83*	+	45		
**19-3	24	35	----	----	60	67	74*	+		1
Control group										
19-2	24	40	47*	----	----	----	0	0	230	
11-8	26	39	----	58*	----	----	0	0		
**18-10	26	38	----	----	72*	----	0	0		
11-6	26	37	----	----	74	86*	0	0		
10-10	25	35	----	----	69	82	94*	0		0

*Slaughter weight; **Pigs with liver adhesions.

B was responsible for the decline in worms recovered from pigs 11-7, 19-1, and 18-2. The number of worms in pig 19-3 was also less than in the pigs killed before it in the group on normal feed. In a series of experiments on these pastures during the past six years, the number of worms per pig has, without drug or antibiotic additives, gradually declined with the increase of the weight and age of the pigs and the lengthening time on pasture. This may be a reflection of individual immunity, with the ability of a pig to shed part or all of its worm load.

The differences in weight gains of the pigs in the two infected groups is not considered significant. The pigs fed hygromycin B gained 21 lb. more but they had a group initial weight advantage of 21 lb. At necropsy, varying degrees of liver adhesions, particularly to the diaphragm, were found in 5 pigs (18-2, 10-8, 19-7, 19-3, and 18-10). Pig 18-2 of the hygromycin B group had many adhesions, which may explain its poor gain during the last week on pasture. Weight gains in 3 pigs (10-8, 19-7, and 19-3) in the normal feed group and 1 pig (18-10) in the control group may also have been affected by liver adhesions. It was later learned that these 5 pigs had been given a 5-cc. intraperitoneal injection of a nonsterile, locally mixed vitamin B complex while on synthetic feed prior to their purchase for this experiment.

The control pigs, which showed no evidence of worm infection, made a signifi-

cant gain. However, they were confined in a smaller space, undoubtedly were less active, and they were protected from several violent rainstorms and a rather wide variation of temperatures.

SUMMARY

The recommended level of hygromycin B fed to 5 pigs did not prevent the occurrence of the migratory phase of ascarids. In this experiment, the merit of the antibiotic as an anthelmintic is difficult to evaluate. In similar experiments with pigs on unmedicated feed on these pastures, the worm load has also decreased with time on pasture and with the increasing age and growth of the pigs. This could be a reflection of immunity. The worm-free control pigs on normal feed showed a significant advantage in weight gain over the two infected groups.

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Congenital Goiter in Pigs.—Congenital goiter appeared in the pigs of 3 sows in a region where goiter is enzootic in Hungary. The gestation periods were two to six days longer than normal, and the pigs died in 24 hours. They were well developed, with sparse hair and severe edema of the subcutis. Their thyroid glands were eight to ten times the normal size and the iodine content was extremely low. The cause was believed to be an inadequacy of iodine, vitamins, and protein in the diet of the sows.—*Vet Bull.* (Nov., 1957): Item 3377.

Identical Twin Heifers Develop Similar Habits.—Identical twin heifers learned to open the latch to their respective pens almost simultaneously.—*Wallaces' Farmer* (Nov. 16, 1957): 13.

Abnormal Urogenital Tract of a Ram

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An otherwise healthy and normal Columbia ram was observed to urinate from an orifice ventral to the anus in a manner typical of a ewe. The tip of the penis, 10 mm. of which protruded from the normal prepuce, appeared to lack a normal urethral opening.

The animal was killed for necropsy and the urogenital organs were dissected out (fig. 1). The following abnormalities were observed: (a) The urethra extended only to the orifice ventral to the anus, and (b) there were two completely separate scrotums, each containing a single testis. The other genital organs appeared normal.

Histological sections were prepared from all of the genital organs and sections were made of the penis at 25-mm. intervals. Pathological changes were observed on the full length of the penis, all sec-

tions of which displayed nearly the same abnormal development.

The penial urethra was represented only by small scattered areas of stratified squamous epithelium and smaller, less frequent areas of stratified columnar epithelium, but these had no functional organization. At no place was there a semblance of a urethra. The corpus cavernosum urethra was typically small and extended through the area which would normally contain the urethra. There was an extensive tunica



Fig. 1.—Dissected urogenital organs showing the urethral opening (arrow), anus (a), rectum (b), penis (c), bulbourethral gland (d), seminal vesicles (e), bladder (f), ductus deferens (g), and testicle (h).

albuginea of collagenous and elastic connective tissue. A comparatively small corpus cavernosum penis was present. Both of the corpora cavernosa contained small amounts of erectile tissue, which was largely fibrous connective tissue with scattered areas of adipose tissue.

From the Department of Veterinary Science, North Dakota Agricultural College, Fargo.

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The So-Called "Downer" Cow Syndrome

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THE "DOWNER" cow is an all too frequent patient in general veterinary practice. The cause or causes of this condition and the results of treatment are as many and varied as there are practitioners attempting to solve this complexity.

I do not propose to review all the more definitive causes of the downer cow, such as uncomplicated parturient paresis, fractures, and septicemias from various causes, but rather to report my experiences and conclusions with the hope that they will stimulate further interest and possibly will add a few more ideas to what is already known about this intriguing, and at times exasperating, disease complex. These opinions and conclusions are based solely on field observations and experiences under uncontrollable and widely variable conditions of environment, feeding, and general husbandry.

CHARACTERISTICS OF DOWNER COWS

The typical downer cow is generally bright and alert, is in sternal recumbency, has good sensitivity over the entire body and legs, and generally shows normal elimination of urine and feces. The heart and lung activities and body temperature are usually within physiological limits as are the appetite and rumination. The Ross test for acetonemia and the test for urine albumin may reveal all degrees of reaction without positive correlation to the outcome of individual cases. In summary, the physical findings are essentially normal except that the cow can not regain her feet.

Two observable characteristics are commonly found in these animals. The first is the extreme generalized muscular weakness exhibited when they are urged to rise. Even after the slightest exertion, they breathe heavily, have generalized muscular tremors, and often "moan." In short, their entire attitude suggests complete loss of muscular strength. The second characteristic is the peculiar attitude of the hindlegs. Extreme knuckling of the fetlock joint occurs as the cow struggles to regain her feet. This is particularly hazardous on wet

smooth surfaces where it often results in both legs becoming fully extended posteriorly and in irreparable damage to the muscles and joints. When their feet do not slip, these animals may attain two thirds to three fourths of the normal standing position and retain this stance for some seconds with the fetlocks strongly flexed and the hocks dropped below their normal position. This stance and the generalized muscular weakness seem to be somewhat pathognomonic and probably portend a deeper failure in the neuromuscular system. Most of these cows, when they finally get up, assume a relatively normal stance but occasionally they continue to show this peculiarity in one hindleg for a variable period.

It is difficult to determine what would be a typical case history for this condition as seen in the dairy cow since factors such as age, feeding, breed, environment, milking ability, and previous medical history are not consistent. It seems to be more prevalent in the early spring months and as a sequela to the otherwise successful treatment of parturient paresis. I have, however, treated this condition in every stage of lactation and gestation and in every month of the year and in 1 calf 5 months old. The incidence of this condition is much higher in the dairy breeds than in the beef breeds.

PROGNOSIS

About 70 per cent of the affected animals will recover in three to 14 days, especially if on pasture. Recovery is generally complete and permanent. Thus the prognosis is favorable, making it the most pleasant part of the experience. It is usually best to discreetly avoid predictions as to when the cow will regain her feet. I find it best to outline an adequate nursing program for the client to undertake and to revisit the patient as often as is practical. These cases will tax your ingenuity not only from the medical but also from the ethical and public relations standpoints. You can make or break your relationship with all but the most faithful clients if your services and fees are not properly

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adjusted with the eventual outcome of the case.

Some of these animals that eventually regain their feet retain the "cocked ankle" condition permanently. A relatively simple yet effective treatment for this abnormality is to force extension of the fetlock joint, either with or without sedation as the individual case dictates, and apply a short plaster-of-paris cast to immobilize the area in the extended position. Such a cast should be left in place for a minimum of 75 days. This treatment has produced good results, the only problem being that considerable chaffing may occur in unconfined animals.

CAUSES

Before deciding on the treatment, the cause of the condition must be considered. We must determine whether we are dealing with a single or multiple pathological condition; whether the inability to arise is a sign of a more basic malfunction; and, finally, whether this condition is the result of present practices in breeding or feeding our increasingly productive cattle.

The so-called "stress theory" is popular today and stress probably plays a role in most abnormal conditions in the higher animals. The downer cow syndrome may not be a simple stress condition, if there be such, but systemic stress probably does play a part. These animals appear to be suffering from a systemic breakdown primarily of the neuromuscular system, accompanied by abnormal metabolic and probably catabolic processes within that system. This is pure theory but it would seem to have a solid foundation.

It is known that protein is the predominantly solid constituent of muscle.³ In recent years, the dynamic qualities of protein metabolism have become recognized. Protein was formerly thought to be utilized solely for cellular maintenance and repair where there was normal energy intake. Today, protein is known to be utilized for energy even in the presence of more than adequate carbohydrate sources and to an even greater extent where energy sources are not adequate.

In Wisconsin's commercial dairy areas, the average dry cow in the last 45 days of gestation is often maintained with the heifers. This means she is generally poorly housed, with the diet consisting mainly of leguminous roughage of variable quality.

These animals consume enormous quantities of this roughage and often the average 1,000-lb. cow will add 200 to 400 lb. to her gross weight (including the fetus) during this period.

Through comparison and observation, it would appear that in the average dairy cow a higher percentage of the weight added during this period would be skeletal muscle than in the average cow of the beef breeds. During a dry period, the good dairy cow always maintains her angularity and symmetry although becoming smooth and sleek, whereas the beef cow becomes patchy and proportionately fatter. Thus, the dairy cow probably carries a greater portion of her nutritional reserve as protein. She not only has to meet tremendous demands for protein during gestation for her own increased blood volume but also for the greater growth of the fetus (compare the average birth weight of Holstein and Hereford calves, with the dams on similar ration), increases in fetal membranes and fluids (especially in the last trimester of pregnancy), a greater increase in the physical size of the udder and, following parturition, the greater secretion of colostrum and of milk. The average percentage protein content is 20.6 for colostrum compared with 3.5 for milk.¹⁰

The average dairy cow, therefore, is in a "dynamic" protein state with additional severe total energy demands on her system. The physical strain of calving and the first flush of milk flow, added to the mentioned activities, tax her body tremendously for all nutrients.

At this time the average dairyman, acting in good faith on time-honored principles of dairy husbandry, often further upsets this delicate nutritional balance. In addition to not providing adequate and easily accessible sources of total feed energy, he may further restrict the fresh cow's total feed intake (at least primary carbohydrate sources such as corn silage and concentrate) for another one to two weeks in an effort to reduce the anticipated "cake" and inflammation of the udder. Thus, coincidental with parturition, the average fresh dairy cow is left with the tremendous job of converting her intrinsic (tissue) and extrinsic (feed) protein sources into needed extra energy and into other intrinsic (tissue) protein of a reparative and proliferative nature. The protein substances from the great muscle masses

of the body must certainly supply some of this essential extra energy and tissue protein. In nontechnical language, the flow of protein from the skeletal muscles is probably rapid and in great quantity at this time.

Discussion

The stress inherent in this critical period lends credence to the hypothesis that the normal dynamic protein shifts in the potential downer cow's body could, at this time, degenerate into various stages of intrinsic muscular breakdown. This condition could assume any degree from a simple and temporary contractual failure, due to partial breakdown of the phosphoprotein enzyme system, to a frank rupture of the muscle under sudden and severe exertion. This hypothesis could then explain the gradations of the downer cow syndrome; the cows that spontaneously regain their feet with apparent normal control, the others that have one or both legs "cocked," and the few that never recover. The literature reports individual findings, such as postparturient myorrhesis⁸ and peroneal nerve paralysis,^{9,10} that are probably visible manifestations of this basic malfunction.

This could explain why the prognosis and the results of treatment are not easily predictable. There could be many degrees of these physical and chemical abnormalities within muscles. However, the general course of treatment should be clear. The best treatment is prevention, and this again emphasizes the veterinarians' long acknowledged but too seldom performed role of preventive medicine. By all means, the dairyman should be advised as to the dry and fresh cow's care and diet.

Once the cow is down and is classified as a "downer," the indicated basic treatment is the repeated administration (parenterally or *per os*) of large quantities of animal protein until hope for eventual recovery is precluded. Supportive treatment must be directed toward promoting normal ruminant digestion. Ample liquids and carbohydrates in the form of water and concentrate feeds are certainly indicated, as are stimulants, including the glucocorticoids, when needed.¹ Adequate, clean quarters and good nursing care obviously are helpful.

Failure of the cow to improve after a reasonable period of treatment probably indicates that irreversible muscle destruc-

tion or some other complicating condition has occurred. Humane disposal of the animal is then advisable.

The so-called "downer" cow syndrome represents only one of the many possible metabolic upsets of the present day dairy cow^{3,4,6,7} under modern methods of care and feeding. It is hoped that this discussion may stimulate further thought in the field of metabolic diseases where many baffling problems are yet to be solved.

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Piperazine Ascaricides for Swine.—Three piperazine compounds, the dihydrochloride (51.0 % piperazine), the sulfate (46.8 %), and the phosphate (41.0 %), were fed for 24 hours to 81 parasitized hogs; they were eaten readily without prior fasting. At levels of 0.40 to 0.49 per cent of the feed, they were 92.4 to 100 per cent effective in the removal of ascarids, the hydrochloride and phosphate compounds being slightly superior. These doses represent from 51.8 mg. to 54.2 mg. of piperazine per pound of body weight.—*J. Anim. Sci.* (Nov., 1957): 943.

More than 310,000 guinea pigs are used annually in medical research. This animal serves science well because of its capacity for infection and its aptitude for parenthood. If supplied with enough green fodder, it can live without water.—*Today's Health* (Sept., 1956): 31.

Iridocyclitis and Cataracts Associated with an Encephalomyelitis in Chickens

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THIS REPORT is concerned with the pathological features of an iridocyclitis with cataracts associated with encephalomyelitis in chickens. The occurrence of this condition, in Texas, and its clinical characteristics have been reported recently.⁹

OCCURRENCE IN TEXAS FLOCKS

Several groups of chickens were submitted to the Poultry Diagnostic Laboratory of the Texas Agricultural Experiment Station, College Station, Texas, because of blindness. The histories of these cases were similar and the gross and microscopic lesions were characteristic. The condition was diagnosed in eight breeds and in flocks from four states. The initial group in which this condition was observed consisted of 20 14-week-old hybrid pullets from a flock of 200 which were bought as "started" pullets (6 wk. old). Affected birds reportedly became blind, usually in both, but occasionally in only one eye, and lost considerable weight. Later investigation revealed that, before sale at 6 weeks of age, the pullets had been selected from a larger group (approx. 3,500) in which blindness was already present and which recently had exhibited signs resembling those of avian encephalomyelitis (epidemic tremor). The other submissions were made to this laboratory by different poultrymen who had obtained started pullets from this same flock.

Chickens in a second group were submitted at 10 weeks of age with the history that approximately 140 of them had died during the first seven weeks of life, with signs that resembled those of avian encephalomyelitis. Many were blind at the time of the submission.

Chickens in a third group affected with this condition were between 6 and 7 months of age. The history included a clinical diagnosis of avian encephalomyelitis.

From the original group, 2,100 birds which were considered to be unaffected were selected and retained as a laying flock. Approximately 350 of this group developed cataracts in one or both eyes. In another flock of 500 pullets belonging to a different producer but originating from the same hatch, 75 had been culled because of blindness and approximately 75 more were similarly affected. A third flock of 2,100 chickens originating from this hatch had approximately 400 birds affected in the same manner.

Other birds submitted to this laboratory had similar histories except that in many cases nervous signs were not observed. The morbidity varied from less than 1 to more than 35 per cent; however, 1 to 5 per cent was considered to be more common.

Physical examination of typical specimens revealed only blindness, most often bilateral, and an occasional nervous defect manifested by bilateral leg weakness or tremors of the head and neck. In two instances, a tendency to back up when excited was observed.

Of 24 flocks examined, clinical avian encephalomyelitis was diagnosed in five. An undiagnosed leg weakness was observed in seven other flocks. Adequate data are not available on three flocks.

Attempts to isolate a viral agent, by using chicken embryos, were unsuccessful. Culturing for bacteria, using fluids from the eye, also has given negative results. Attempts to reproduce the condition in chickens were inconclusive except for the production of microscopic lesions of an encephalomyelitis closely resembling the lesions seen in natural cases and slight iridocyclitis as indicated by inflammatory cellular exudates.

GROSS AND MICROSCOPIC LESIONS

Gross Pathology.—Usually, both eyes had gray pupils (cataract) and slight paleness of the iris. Occasionally, the pupillary response to light was slightly impaired. In most cases, dissection of the eye after fixation in 10 per cent formalin revealed a gray, cloudy lens which was thin, flabby, and consisted of a thin membranous sac. A few eyes

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Fig. 1—Early degeneration of the epithelium and lens fibers (a), liquefaction of lens fibers (b), and infiltration of inflammatory cells in the iris (arrows). x 85.

had lenses of normal conformation, except for the gray areas on the surface or around the attachment to the ciliary zonule. The retina was intact. Gross lesions were not observed in the other organs.

Microscopic Lesions.—Fifty chickens, exclusive of experimental cases, were examined microscopically. The obvious pathological changes in the ocular bulb were restricted to the lens, iris, ciliary body, and the tissue around the canal of Schlemm. In the less advanced cases, there was necrosis of the epithelium of the lens near the attachment of the ciliary zonule. In some cases, the necrosis extended to the anterior surface and there was posterior synechia. These early lesions were accompanied by marked perivascular and interstitial infiltration in the iris, ciliary body, and the area surrounding the canal of Schlemm. The primary reactive cells were mature lymphocytes, plasma cells, and a few heterophils (fig. 1). In the more advanced cases, there was marked proliferation of the lens epithelium, dissolution of the lens substance with separation of the lens fibrils, and formation of Morgagnian globules. In the more advanced lesion, the lens was a collapsed "sac" containing Morgagnian globules, and proteinaceous fluid.

There was a proliferation of the epithelium on the anterior and posterior surfaces of the lens. Occasionally, the nucleus of the lens was left floating

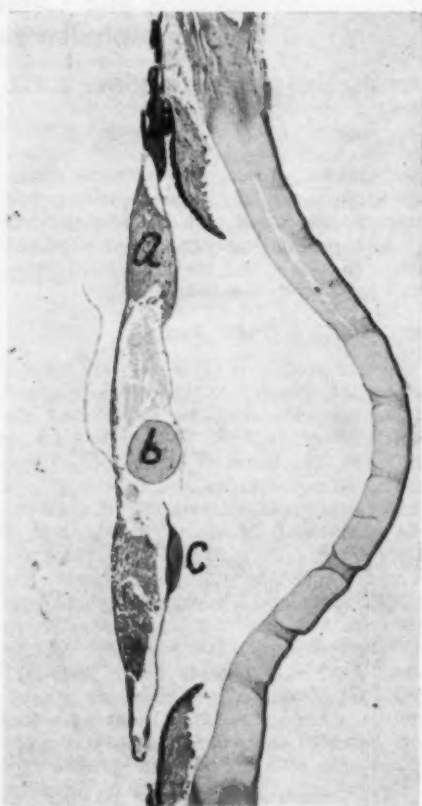


Fig. 2—Advanced cataract with degenerated lens fibers (a), nucleus of the lens (b) persisting in the center of proteinaceous residuum, and focal proliferation of the lens epithelium (c). The irregularities in the cornea are artefacts. x 18.

in the proteinaceous fluid (fig. 2). Ameboid lymphocytes were present in the humors around the lens. In the advanced lesions, the lymphocytes and heterophils in the iris and ciliary body were replaced by plasma cells (fig. 3).

Microscopic lesions were also present in all of the brains and most of the spinal cords of the chickens with cataracts. These varied from a few scattered areas of perivascular cuffing by lymphocytes and occasional plasma cells to intense infiltrations of these cells, usually more prominent in the cerebellum and medulla (fig. 4). A few lymphocytes and plasma cells were found in the nervous tissue surrounding the small blood vessels, along with some gliosis. Neuronophagia was present but not prominent, although numerous shrunken hyperchromic neurons were seen (fig. 5). There was strong suggestion of endothelial proliferation in the capillaries and venules. Similar lesions were found in the spinal cord of many individuals. The

inflammatory exudate was largely restricted to the gray matter and contiguous white matter. Marked neuronal degeneration and some inflammatory exudate were present in the spinal ganglia and the ciliary ganglia of several individuals.

In some chickens, lymphoid hyperplasia was evident in all organs examined including the heart, spleen, liver, pancreas, intestine, ventriculus, and proventriculus. Lymphoid and plasma cell infiltrations were present in the skeletal muscles. All peripheral nerve trunks were free of inflammatory cells. The lesions in the brain, spinal cord, and visceral organs were similar to the lesions which have been reported for avian encephalomyelitis (epidemic tremor), except that the axon reaction in the neurons as described for the latter disease¹² was seldom seen.

DISCUSSION

Reports of cataract formation in chickens are scarce and their occurrence in such proportions in any species is unusual. Ocular cataracts had been reported^{4,13} in chickens following the occurrence of clinical avian encephalomyelitis (epidemic tremor). Encephalitis was reproduced by the inoculation of susceptible chickens with ocular tissues.¹⁵ Bilateral lamellar cataract formation was described⁶ in 9 chickens in a small flock of 50 which were approximately 14 weeks old. Attempts to reproduce the condition failed and no explanation was advanced for the occurrence of this condition.

Fig. 3—Advanced cataract (higher magnification of fig. 2). Loss of epithelial cells and lens fibers in the nuclear zone of the lens (d), degeneration of the lens fibers (a), and minimal numbers of inflammatory cells in the iris (e).

x 150.





Fig. 4—Section of the cerebellum showing perivascular infiltration of inflammatory cells (arrows). $\times 150$.

The occurrence of cataracts in turkey embryos from dams which were on a diet deficient in vitamin E was recently reported.^{7,8} The lesions described were notably lacking in exudative inflammation, and encephalomyelitis was not mentioned.

Ocular defects, including cataracts in chicken embryos inoculated with the virus of Newcastle disease during early incubation, were reported,² as was a similar condition in chicken embryos inoculated with influenza A virus.¹⁴ Ocular defects have occurred in certain children born to mothers who were infected with measles during the first trimester of pregnancy.¹³ Intraocular injection of the virus of avian encephalomyelitis produced an iridocyclitis in 16 of 30 young chickens.⁶ In contrast to these observations, iritis is not included in descriptions of the lesions of avian encephalomyelitis. It has been stated¹² that the disease occurs in the absence of this lesion.

A primary iridocyclitis, which was considered to be quite different from ocular and neural leukosis, was described¹ in fowl in England, and Veenedaal (1929) was quoted as describing a sporadically occurring iridocyclochoroiditis which appeared in several birds at one time and regularly ended in blindness. In the beginning there was photophobia, watery eyes, and cloudiness of the cornea. As the cornea became vascularized, the iris became pale and swollen and later adhered to the lens, thus causing cataract. It was reported¹ that, if the blind birds were protected and allowed easy access to food, they continued production and fared quite well.

It has been said that it is difficult, if not impossible, to differentiate neural leukosis of the central nervous system from avian encephalomyelitis.¹¹ Therefore, it would appear necessary to differentiate this condition from ocular leukosis and leukosis of the central nervous system. In this material, neoplasia was not in evidence. There was a definite tendency for the lymphocytes in the eye to be replaced almost entirely with plasma cells and no tumefactions were found in these birds. Cataracts are not ordinarily encountered in early ocular leukosis and no irregularities were present in the irises of these cases as is so often true in ocular leukosis.

The concurrent appearance of the ocular lesions with lesions of an encephalomyelitis is suggestive that there is a relationship. This, however, is quite circumstantial. A confirmed laboratory diagnosis of avian encephalomyelitis by virus isolation and serological typing in the flocks mentioned above is not available. However, the occurrence of the typical signs was described by the flock owners and, in one case, restitution was reported to have been made to the owner by a hatchery because avian encephalomyelitis was diagnosed by "a laboratory." This could not be confirmed because of the lack of adequate records. However, it would be a unique phenomenon if, after many years, the virus of avian encephalomyelitis should manifest a new and previously unrecognized gross lesion of such magnitude.

Although these chickens were most often 6 to 14 weeks old, a few were young adults, and blindness reportedly occurred as early as 3 weeks of age and as late as 6 months of age. Nervous signs were minimal when present.

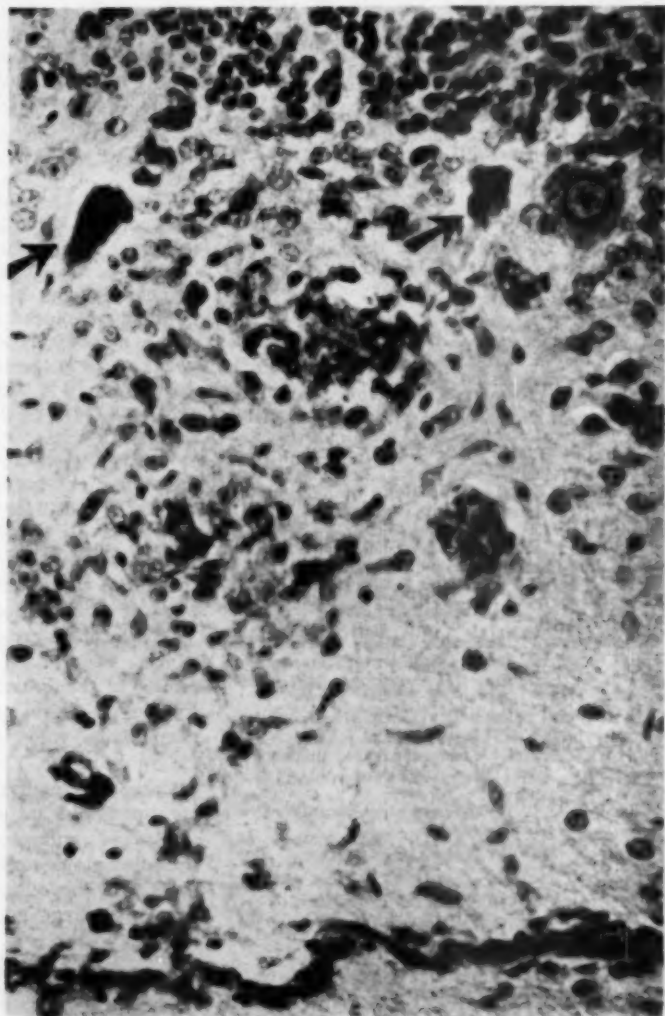
This pathological entity, evidently a sequela of a viral infection, has become of considerable importance to the poultry industry of the State of Texas and elsewhere. It is of considerable interest in the realm of comparative pathology inasmuch as descriptions of similar pathological phenomena in other species have not been found in the available literature. Recently, the viruses of Newcastle disease³ and infectious bronchitis¹⁰ have been isolated from the aqueous humors of chickens recovering from natural infections. Such observations

suggest direct attack by the virus on the ocular tissue of maturing birds. The etiological factor or factors involved in the cataract condition must be identified before the true nature of the problem can be determined.

SUMMARY

The pathological features of cataracts and iridocyclitis associated with encephalomyelitis in chickens are described. The condition often followed the occurrence of what was described as "epidemic tremor"

Fig. 5—Higher magnification of the inflammatory reaction in the cerebellum showing perivascular cuffing, gliosis, and shrunken Purkinje cells (arrows).
x 975.



by the owners and by poultry diagnostic laboratories. The incidence of cataracts was occasionally as high as 35 per cent of a flock.

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- Caged Hens More Productive.**—Two ten-month trials involving 4,000 laying hens indicated that caged hens laid 4 per cent more eggs, ate 0.37 lb. less feed per dozen eggs, with 8 per cent lower mortality than similar groups of noncaged hens.—*Feeds Illus. (Sept., 1957): 23.*

Extreme Mortality in Hjarre's Disease (Coligranuloma) in Chickens

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Puyallup and Pullman, Washington

A condition of chickens characterized by tuberculosis-like granulomas was first described in Sweden in 1945.² Since that time, sporadic reports of a similar condition in North America have been made by several workers.^{1,3-6} In none of these reports did the condition assume serious proportions. The condition appears to be of interest chiefly owing to the similarity of the lesions to those of tuberculosis. The two reports presented here resulted in a total loss of pullet flocks being raised for replacement layers.

CASE REPORTS

Flock 1.—The disease was first observed on a poultry farm located in a wooded area on Puget Sound. Some 2,000 sexed single-comb White Leghorn pullet chicks were purchased from a breeder-hatchery farm. These were placed in the owner's brooder house directly from the hatchery. At 6 weeks of age, the chickens were moved to shelters on a range which had not been used for poultry for the previous three years.

When the chickens were 10 weeks old, the owner observed that a few individuals had lost weight. He did not become alarmed about the condition of the flock until the chicks were 12 weeks old. At that time, specimens were submitted to our laboratory for examination.

At necropsy, gross lesions resembling advanced generalized tuberculosis were observed in the intestine, liver, and bursa of Fabricius. These lesions were gray, firm granulomas varying from 0.1 cm. to 4.0 cm. in diameter. They had a central portion of caseous irregular necrotic tissue. Several specimens did not show gross liver lesions.

Stained microscopic sections showed granulomatous areas with central caseous necrosis. The outer wall of fibrous tissue contained large multinucleated giant cells.

From the Department of Veterinary Science, State College of Washington, Puyallup (Hamilton), and the Washington Agricultural Experiment Stations, Pullman (Conrad). Project No. 9073.

No acid-fast organisms were observed in smears on histological sections.

A mucoid-encapsulated *Escherichia coli* was isolated from the lesions. Inoculation of experimental chickens of different ages by oral, intravenous, or intraperitoneal administration failed to produce any pathological lesions.

By the time the pullets were 24 weeks of age, 1,500 had either died or been culled and killed. The owner then sold the balance of the flock to a processing plant where he was paid on the basis of sound carcasses at the time of evisceration.

Flock 2.—The disease occurred on a poultry farm in the Puget Sound area, some 100 miles from where flock 1 was located. About 1,100 sexed day-old single-comb White Leghorn pullet chicks were purchased from a local breeding farm. These were started in a clean brooder house and ranged on one-fourth acre of open, sandy, well-drained soil planted to orchard grass and Ladino clover. This land had been used the previous two years as a cattle pasture.

The owner first observed signs of disease when the chickens were 12 weeks old. These consisted of a diarrhea resulting in wet vent fluffs, pale shanks, and emaciation. When the flock was 16 weeks old, it was estimated that 75 per cent of the flock was affected. Although the pullets were about normal in size and were active, handling the birds revealed an amazing degree of emaciation. The laboratory findings were essentially the same as in flock 1.

During the four weeks after the owner observed the illness, 150 chickens died. Because of the large number of moribund birds in the flock, all of the birds were killed at 16½ weeks of age and sent to a rendering plant. Housed about 40 ft. from the range were 800 apparently normal year-old hens.

Since then, both farms have continued to raise chickens without further evidence of the disease.

In Washington, chickens and turkeys have occasionally been observed with lesions which resembled Hjarre's disease without a generalized flock infection. However, evidence from these two flocks indicate that the disease can reach serious enzootic proportions.

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Carcinoma of the Rumen in a Cow.—An Ayrshire cow, 10 years old, developed acute ruminal tympany which was relieved three times by trocharization at intervals of a few days. The tympany continued but did not merit further surgical intervention, and the cow gradually lost condition. On laparotomy 12 weeks later, a mass was palpated in the medial wall of the rumen just posterior to the esophageal orifice, and rumenotomy revealed a red fungating mass 3 inches in diameter which, on biopsy, proved to be a squamous-cell carcinoma. Lesions were confined to the rumen and the regional lymph nodes.—S. Jennings and W. I. M. McIntyre in Vet. Rec. (Nov. 16, 1957): 1066.

Toxicological Evaluation of Gibberellic Acid.—Gibberellic acid, a product of the fungus *Gibberella fujikuroi*, which accelerates plant growth, was tested for its toxic effect on man or animals. No deaths resulted and there were only minimal signs of intoxication whether it was given intravenously, orally, by inhalation, or by topical application.—Science (Nov. 22, 1957): 1064.

Tuberculosis in Man.—The prevalence of tuberculosis in the United States, in 1956, was estimated at 250,000 active, and 550,000 inactive, cases. This is 30 per cent fewer active cases than in 1952. The number of inactive cases will probably continue to decline since it is now composed largely of older persons.—Pub. Health Rep. (Nov., 1957): 963.

The Veterinary Pathologist in Pharmaceutical Research

GUEST EDITORIAL

A new field has been opened to veterinary pathologists in the past ten years. It is concerned with the development of new pharmaceuticals for man and animals.

In the research laboratory of most pharmaceutical manufacturers a new compound generally originates with the chemist. The activity, or lack of activity, of the compound is determined by the bacteriologist, biochemist, endocrinologist, mycologist, parasitologist, or pharmacologist.

The possible toxic effects or, in other words, the safety of the compound is characterized by the toxicologist and pathologist. If the drug appears to have desirable activity and seems safe for therapeutic use, these laboratory procedures are followed by extensive clinical investigations directed by the physicians and veterinarians employed by the company.

The Food and Drug Administration then thoroughly studies the results of all these tests and investigations before deciding whether the efficacy and safety of the preparation justify its release.

The veterinary pathologist, because of his training in the diagnosis of functional disturbances and morphological changes in animal tissues, is specifically qualified to characterize the safety of the compound for use. This information is obtained from toxicity tests—acute, subacute, and chronic. The subacute and chronic tests fall logically in the domain of the pathologist.

TYPES OF TESTS AND ANIMALS USED

Subacute toxicity tests are generally run in several species of animals for approximately four weeks. The type of compound, its activity, and route of administration often determines the species of animals selected. The pathologist observes the animals prior to and while under test for signs of altered behavior or function. He supplements these examinations with clinical laboratory tests, including biochemical (of blood and urine), hematological, and functional (of the liver and kidneys).

All animals used in the tests, including normal controls, are necropsied either when they die during the test or at its termination. At necropsy, the pathologist observes and records a description of even the most minute lesions. Subsequently, the tissue sections from practically every or-

gan are examined microscopically for any sign of histological deviation from normal.

If the new drug is one which will be used for a patient over long periods, chronic toxicity tests are also employed. They are similar to the subacute tests, except that the periods during which they are run are lengthened to 60, 90, or 120 days and, at times, to six months or even to the normal life span of the particular test animal.

To be of greatest value in this work, the laboratory animals must be of standard size and free from extraneous lesions that might make it difficult for the pathologist to evaluate the effects of the new drug. This has created another function for the veterinary pathologist: that of raising colonies of laboratory animals free from pathogens and genetic defects.

OPPORTUNITIES FOR INDEPENDENT RESEARCH

In any area of research, such as infectious diseases, endocrinology, pharmacology, nutrition, and biochemistry, in a pharmaceutical laboratory where animals are used, the veterinary pathologist operates as a consultant or collaborator in problems pertaining to animals or the interpretation of pathological changes in animal tissue.

In ascertaining the activity of a new compound, the research biologist is often in need of surgical assistance in preparing animals for the tests. The veterinary pathologist, by training, is often the most qualified person for this service. For the surgically inclined pathologist, this service adds variety to his activities.

In some pharmaceutical research laboratories, the veterinary pathologist is encouraged to devote a portion of his time to original research of his own choosing. He is urged to affiliate with the American College of Veterinary Pathologists, the state and national pathological societies, and to attend their meetings. A complete company library makes it possible for him to keep abreast of the current literature in his and related fields.

The young, well-trained, research-minded veterinary pathologist should give consideration to this new and rapidly expanding field of service.—*R. A. Runnells, D.V.M., Resident Consultant in Pathology, The Upjohn Co., Kalamazoo, Mich.*

ABSTRACTS

Detection of Foot-and-Mouth Disease Antibody

By direct complement-fixation technique, complement-fixing antibodies were detected in the serums of cattle seven days following experimental infection with foot-and-mouth disease virus.

Four cattle were used for each of the virus types, O, A, and C. Maximum complement-fixation occurred at two to three weeks after infection, followed by a rapid and later a gradual decrease. The method used, and particularly those features of the method which influence specificity and reproducibility, are described.—[A. A. Marucci: *Direct Complement Fixation for Detection of Foot-and-Mouth Disease Antibody in Serums from Experimentally Infected Cattle*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 785-791.]

Detection of Anaplasma Marginale

A globulin fraction was separated from serums of calves experimentally infected with *Anaplasma marginale* and conjugated to fluorescein. Alcohol-fixed organisms present in the infected blood films became fluorescent when exposed to the conjugated globulin. Immunological specificity of the staining was ascertained by employment of suitable controls. The ability of an unlabeled immune serum to block the fluorescence reaction offers a means of testing unknown serums for the presence of the antibody.—[M. Ristic, F. H. White, and D. A. Sanders: *Detection of Anaplasma Marginale by Means of Fluorescein-Labeled Antibody*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 924-928.]

The Virus of Virus Diarrhea

A strain of virus isolated from a calf with virus diarrhea in New York State has been maintained for 20 consecutive passages in bovine embryonic skin-muscle tissue prepared in roller tubes by plasma-clot method and for 15 further transfers in embryonic bovine kidney cortex cells prepared by trypsinization. Multiplication of virus was not associated with conspicuous cytopathogenic effect on cells, but virus was apparently maintained at full virulence. The concentration of virus in fluid from these tissue-cultured cells ranged from 10^5 to 10^7 when tested in cattle.—[K. M. Lee and J. H. Gillespie: *Propagation of Virus Diarrhea Virus of Cattle in Tissue Cultures*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 952-953.]

Agglutinating Antigens of Vibrio Fetus Variants

Presence of a thermolabile superficial antigen on the smooth *Vibrio fetus* cell was demonstrated by use of agglutination and agglutinin-absorption tests. This characteristic was not completely substantiated on the rough variant cell in the agglutinin-absorption test. Boiling for two hours de-

stroyed or removed completely the superficial antigen of "true" *V. fetus* and only partially degraded or removed the superficial antigen of the "saprophytic" *Vibrio*.

Degrees of heterogeneity and inagglutinability were demonstrated between smooth and rough variants within the parent culture and among the variants of five strains. Serological heterogeneity of the variants was considerably minimized by use of heat-treated antigens. The greatest number of cross-reactions between strains resulted when rough heated antigens were agglutinated with antisera prepared against rough heated cells. Heat stable antigens of *V. fetus* variants were, to a degree, serologically shared with saprophytic noncatalase-producing *Vibrio*.

On the basis of the data presented, it appears that use of heated antigen in addition to formalized antigen may aid in the interpretation of the serological tests used for the diagnosis of vibriosis.—[M. Ristic, F. H. White, R. B. Doty, M. Herzberg, and D. A. Sanders: *The Characteristics of Agglutinating Antigens of Vibrio Fetus Variants. I. Effects of Heat and Formalin on Serological Activity*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 764-770.]

Equine Ringworm

In the course of a survey of ringworm in animals, five dermatophyte species were found associated with equine ringworm. In order of frequency these were (1) *Trichophyton equinum*, (2) *Microsporum canis*, (3) *Trichophyton mentagrophytes* var. *granular*, (4) *Trichophyton verrucosum*, and (5) *Microsporum gypseum*. Each of the fungi and the disease they produce is discussed.

The taxonomic status of *T. equinum* is reviewed on the basis of its morphological and physiological characteristics. It is recommended that *T. equinum* (Matruchot and Dassonville) Geddoelst 1902, be considered a valid species.—[Lucille K. Georg, W. Kaplan, and LaVerne B. Camp: *Equine Ringworm with Special Reference to Trichophyton Equinum*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 798-810.]

Siderosis of the Kidneys in Goats

The unique features of spontaneous bilateral siderosis in the renal cortex of goats from northern Iraq are described. Iron deposition is rare or absent in organs other than the kidney. Copper is found to be increased in various organs, particularly in the testes, which suggests that increased amounts of this element cause the observed high incidence of testicular atrophy. This condition seems to occur only in the mountainous area of northern Iraq, reached only by goats, which is rich in copper and iron but deficient in cobalt.

The deposition of ferric compounds in the proximal convoluted tubules does not, of itself, cause clinical manifestations, dysfunction, or important histological changes, except thickening of the basement membrane. The findings in the urine, stools, blood, and serum of goats with both normal

and pigmented kidneys are recorded. Goats fed low doses of inorganic iron and copper, together with ordinary feed, revealed no functional or anatomical disorder; those fed high doses, with protein deficient diets, showed generalized siderosis of the viscera, particularly of the kidney, with parenchymatous changes in various organs. Neither group developed lesions similar to those of spontaneous symmetrical cortical siderosis.

Some other factor, perhaps a deficiency of cobalt, may be required to produce this condition. Iron deposition in the convoluted tubules produces no renal functional disturbances; therefore, the affected animals show no diagnostic clinical or laboratory findings. The role of copper in the production of the disease is not known.—[*Showket Al Zabawi: Symmetrical Cortical Siderosis of the Kidneys in Goats. Am. J. Vet. Res., 18, (Oct., 1957): 861-867.*]

Viremia and Immunity in Swine Fever

Eight domestic pigs, which survived for 86 to 456 days after African swine fever (ASF) exposures, showed a persistence of viremia which was demonstrated by subinoculating susceptible pigs. Two of the 8 pigs showed a coexistence of viremia and circulating antibodies. Protective antibodies were demonstrated in the serums of these 2 pigs 27 and 33 days, respectively, after the initial exposure, but could not be demonstrated thereafter although the viremia persisted. Two of these domestic pigs showed ASF viremia without showing clinical reaction to the original exposure.

Domestic pigs, as well as wart hogs and bush pigs, may become carriers and potential spreaders of ASF. Killed antigen vaccines failed to induce immunity to ASF. Resistance to reinfection with ASF virus may depend on a persisting infection rather than on the persistence of circulating antibodies.—[*Donald E. DeTray: Persistence of Viremia and Immunity in African Swine Fever. Am. J. Vet. Res., 18, (Oct., 1957): 811-816.*]

Infectious Synovitis Control

Nine infective agents were isolated from the joint purulent exudate, tracheal mucus, or spleens of birds with infectious synovitis (IS) from seven flocks; PPLO was isolated from the joint purulent exudate of 1 bird of another flock. When inoculated into the foot pads of chickens, seven of the nine IS isolates produced signs and lesions typical of IS; the other two produced only temporary swellings in the inoculated foot pad. The PPLO isolate produced lesions in chickens similar to that produced by IS. PPLO antibodies were found in the serum from chickens previously inoculated with the PPLO isolate but not in the serums from those inoculated with the nine isolates of IS.

Chlortetracycline, 100 or 200 Gm. per ton of feed, was effective, whereas furazolidone (NF-180), 200 Gm. per ton of feed, was ineffective in the control of IS. Neither drug had therapeutic value against the disease caused by the two atypi-

cal strains of the IS agent. Chlortetracycline was partially effective, but NF-180 was ineffective against the disease caused by the PPLO agent.

The two atypical strains of the IS agent induced immunity to only the agent in these strains. Similar tests with the other isolates were not possible.—[*N. O. Olson, D. C. Shelton, and D. A. Munro: Infectious Synovitis Control by Medication—Effect of Strain Differences and Pleuropneumonia-like Organisms. Am. J. Vet. Res., 18, (Oct., 1957): 735-739.*]

Arthritis in Chicken Embryos

Examination of chicken embryos, selected one to eight days after inoculation with PPLO, revealed the development of arthritic lesions from the earliest stage of hyperemia to the stage of fibrous organization. Necrosis began early and involved first the synovial cell layer and later the articular cartilage. Necrosis preceded cellular invasion.

The joint capsule was infiltrated by mononuclear cells on the third day, but the joint cavity was free of cells until the sixth day. After the sixth day, mononuclear cells accumulated in the joint cavity in great numbers. The vascular and cellular components of the process subsided by the eighth day when fibrous organization appeared.—[*J. E. Moulton and H. E. Adler: Pathogenesis of Arthritis in Chicken Embryos Caused by a Pleuropneumonia-like Organism. Am. J. Vet. Res., 18, (Oct., 1957): 731-734.*]

Packed Cell Volume and Erythrocytes in Canine Blood

A statistical analysis of 562 packed cell volume (PCV) readings of canine blood and the corresponding erythrocyte counts reveals a high correlation between a PCV and the mean erythrocyte number observed for that PCV. A formula is given allowing the calculation of an estimate of this mean erythrocyte number from a single PCV reading. These estimated erythrocyte numbers, together with their respective standard deviations, are presented in a table for each PCV from 10 to 62 mm. The standard errors decrease with decreasing values of PCV.

The generally small standard errors show that the table allows a precise prediction of the mean erythrocyte number from a single PCV reading, limiting the actual counting of erythrocytes to those rare cases in which clinical examination and observation of the stained blood film indicate that it is necessary. The statistical procedures used are described briefly.—[*A. Ugliero and H. L. Adler: The Correlation Between Packed Cell Volume and Erythrocyte Number in Canine Blood. Am. J. Vet. Res., 18, (Oct., 1957): 909-911.*]

Chemotherapy of Canine Filariasis

These studies support previous reports that diethylcarbamazine and the organic antimonials are

primary microfilaricides. No indication was found of activity against the adult worms by diethylcarbamazine. The activity of the antimonials against adult worms was slow and uncertain and, furthermore, the doses which regularly resulted even in delayed deaths of the parasite invariably were toxic. The only practical value of either diethylcarbamazine or the antimonials is for the destruction of the microfilariae. With the antimonials, one or two large doses are more effective than the same total amount given in multiple small doses.

No evidence of activity against either the microfilariae or the adult worms was shown by acriflavine, naphthalene, formalin, or the organic compounds of mercury or bismuth.

The substituted phenyl arsenoxides were found to be the most active against the adult worms but to have little or no microfilaricidal activity. Of these compounds, dichlorophenarsine hydrochloride was most promising. As little as three daily doses totaling 1.0 mg. of arsenic per kilogram of body weight was sufficient to kill all the adult worms within ten days after treatment.—[Seiji Kume: *Chemotherapy of Canine Filariasis*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 912-923.]

Protease and Rabies Virus

An antigen was prepared by the proteolysis of rabbit brain tissue infected with a fixed strain of rabies virus with a bacterial protease (Protease 15). Although the enzyme adversely affects the ability of the virus to induce the formation of neutralizing antibodies, it did not interfere with its complement-fixing antigenicity.—[Samuel W. Thompson, II: *Some Effects of a Bacterial Protease on the Complement-Fixing Antigenicity of Rabies Virus*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 895-897.]

Antigenic Characteristics of Rabies Virus

Rabbit brain emulsions of five strains of rabies virus were subjected to proteolysis with each of five enzymes (trypsin, Rhozyme P-11, Protease 15, Protease (trypsin), and Proteinase A). Groups of mice were inoculated intracerebrally with each dilution of serial tenfold dilutions of each enzyme-brain emulsion preparation. Surviving mice were challenged intracerebrally with 4 I.D.₅₀ of homologous virus, 21 days after inoculation. The mice inoculated intracerebrally with enzyme-brain emulsions treated with either Rhozyme P-11 or Protease 15 developed an immunity. Mice given single or multiple intraperitoneal inoculations of a supernatant fluid of a 10 per cent suspension of rabies-infected rabbit brain emulsion, subjected to proteolysis with either Rhozyme P-11 or Protease 15, showed no immunity upon challenge 14 days subsequent to inoculation.

The percentage of decrease in the I.D.₅₀ of active virus, following proteolysis at 37 C. for four hours, varied between strains, from 88 to 99 per cent. Infected rabbit brain emulsions of each virus, when subjected to a temperature of 37 C. for four hours

in the absence of any enzyme, exhibited decreases in titer ranging from 37 to 80 per cent. An inverse relation exists between the decrease in titer of a virus, attributable solely to treatment at 37 C. for four hours, and the decrease attributed solely to the effect of the enzymes.—[Samuel W. Thompson, II: *The Effect of Five Proteolytic Enzymes on Some Antigenic Characteristics of Rabies Virus—with Observations on the Resistance of the Virus to Heat*. *Am. J. Vet. Res.*, 18, (Oct., 1957): 886-894.]

BOOKS AND REPORTS

Methods in Surgical Pathology

The text is written primarily for the resident trainee in surgical pathology. It will be found useful to anyone interested in the gross examination and study of surgical pathological material.

Veterinary surgeons can take advantage of the techniques and methods used by surgery on the human body, but the differences in available equipment, the handling of patients before and after surgery, and the fees that can be collected, present insurmountable barriers. While man and lower animals follow much the same patterns, species differences present anatomical and physiological handicaps.

However, much good can be gained by knowing what should be done when circumstances permit.

The greatest value of the text would be as a guide in the preparation of a comparable one based on veterinary experience. This applies especially to the "Appendix" showing how to make clinical and diagnostic reports. Greater emphasis could have been placed upon methods of indexing material for future reference.—[*Methods in Surgical Pathology*. By Henry A. Telob, M.D. 127 pages. Charles C Thomas, 301-327 E. Lawrence Ave., Springfield, Ill. 1957. Price \$4.75.]—H. E. KINGMAN, SR.

Guide to Career Information

This is a bibliography of recent occupational literature prepared by the Career Information Service of the New York Life Insurance Co. as a new activity of its public service program. It lists over 800 books and pamphlets grouped under 52 occupational categories including the professions. A brief resumé follows each listing with the number of pages, price, and where the material can be obtained.

The demand for occupational literature is increasing as is the number of young people who are trying to analyze career and job opportunities and decide what they want to do; hence, the book should be of value to parents, teachers, counselors, and others who work with young people.—[*Guide to Career Information*. Compiled by Career Information Service, New York Life Insurance Co. 203 pages. Harper & Brothers, 49 E. 33rd St., New York, N. Y. 203 pages. 1957. Price \$3.00.]—J. G. HARDENBERGH.

THE NEWS

Dr. Bridges, AVMA Research Fellow

Dr. Charles H. Bridges (TEX '45), an AVMA research fellow, has completed his graduate studies and his thesis, "The Histopathological Diagnosis of Leptospirosis," is on file in the AVMA library.

After receiving his D.V.M. degree, Dr. Bridges was in general practice at Brenham, Texas, until



Dr. Charles H. Bridges

1949. He then served on the faculty of Louisiana State University for two years and with the veterinary service of the U. S. Air Force. In 1953, he returned to Texas A. & M. for graduate study, receiving his M.S. degree in 1954 and his Ph.D. in 1957.

Dr. Bridges, an AVMA research fellow in 1954 and 1955, spent approximately seven months of 1955 at the Armed Forces Institute of Pathology in Washington, D. C., where he did a major portion of the research for his thesis. Since September, 1955, he has served on the faculty of the School of Veterinary Medicine, Texas A. & M. College.

Dr. Bridges is a member of the American College of Veterinary Pathologists, the AVMA, and the Texas V.M.A. He is the author or co-author of "Multiple Cartilaginous Exostoses in Dogs" (*J.A.V.M.A.*, 129, (Aug. 15, 1956): 131-135); "Maduromycotic Mycetomas in Animals" (*Am. J. Path.*, 33, (1957): 411-427); "Kerr's Improved Warthin-Starry Technic, Study of Permissible Variations" (*Lab. Invest.*, 6, (1957): 357-367, an excerpt from his thesis); and "Iridocyclitis and Cataracts Associated with Encephalomyelitis in Chickens" (see pp. 79-84).

Animal Care Panel

The eighth annual meeting of the Animal Care Panel was held at the Bellevue Hotel, San Francisco, on Nov. 7-9, 1957. The registration totaled 174.

Dr. Bennett J. Cohen, University of California, Los Angeles, headed the program committee. In addition to the session on the "Production and Use of Laboratory Animals Free of Specific Pathogens," and a special session for animal technicians on "Insect and Rodent Control in Animal Quarters," there were 20 other papers on laboratory animal production, nutrition, care, and diseases.

All of these papers and the additional reports of original research on the care and diseases of laboratory animals will be published in the official journal of the society, *The Proceedings of the Animal Care Panel*, which is published in cooperation with the New York Academy of Sciences.

The new officers elected were: Jules S. Cass, University of Cincinnati, president; Bennett J. Cohen, University of California, vice-president and president-elect; and Robert J. Flynn, Argonne National Laboratory, secretary-treasurer.

The ninth annual meeting will be held at the Hamilton Hotel, Chicago, Ill., on Dec. 3-5, 1958. Information concerning the panel may be obtained from Dr. Robert J. Flynn, Animal Care Panel, Argonne National Laboratory, Box 299, Lemont, Ill.

s/ROBERT J. FLYNN, Secretary-Treasurer.

Seventy-First Annual Meeting of Veterinary Division—Land-Grant College Association

The Division of Veterinary Medicine of the American Association of Land-Grant Colleges and Universities held its annual meeting during the Association's seventy-first annual convention in Denver, Nov. 11-14, 1957.

On the first day, representatives went to Fort Collins to visit Colorado State University, where opportunity was given to meet the faculty and staff of the College of Veterinary Medicine; to inspect its teaching, research, and extension facilities; and to observe other activities and developments.

The regular program of the division in Denver included a presentation of teaching aids, their use, evaluation, trends in adaptation to veterinary medical teaching programs by Dr. Robert Getty, Iowa State College. The subject of summer clinics as additional aids to veterinary education was presented by Dr. W. R. Krill, Ohio State University, and the topic, "Should the Preveterinary Curriculum Be Further Standardized?" was discussed by Drs. W. A. Hagan, New York State Veterinary College; G. S. Harshfield, South Dakota State College; J. W. Scales, Mississippi State College; and A. L. Bortree, Pennsylvania State University.

Drs. C. L. Comar, New York State Veterinary College; B. F. Trum, Atomic Energy Commission; and W. T. S. Thorp, University of Minnesota, discussed the veterinarian's education, responsibilities, and role in the atomic age.

At the business session, resolutions were adopted reiterating the Division's opposition to the discontinuance of the Veterinary Corps of the Army and Air Force.

s/D. A. SANDERS, *Division Secretary.*

Poultry Disease Diagnostic Short Course Held at Iowa State College

Veterinarians in the animal disease eradication division of the Agricultural Research Service, U.S.D.A., from 22 states attended a poultry disease diagnostic short course conducted at Iowa State College by the Division of Veterinary Medicine from Oct. 21 to Nov. 1, 1957. In addition to the veterinarians, two circuit supervisors from the Inspection Branch of the Poultry Division of the Agricultural Marketing Service attended the course.

Arrangements for the short course were made through Dr. C. D. Lee, extension veterinarian, and Dr. I. A. Merchant, dean of the Division of Veterinary Medicine, at Ames.

Veterinarians of ARS, who completed the course, will act as poultry disease diagnosticians in the states they represent and in surrounding states. They will be available for differential diagnostic work, and will also function with the cooperating and reference labora-

tories established for coping with an outbreak of foreign poultry diseases or unusual domestic outbreaks.

Officials stated that the excellent cooperation received from the veterinary schools and departments makes possible this "in service" training for veterinarians.

Professional Public Relations Support

Many organizations, in addition to the AVMA, promote the interests of the veterinary profession through programs of public information. One of the oldest such groups, Associated Veterinary Laboratories, has voted to expand their program for 1958.

The member companies of Associated Veterinary Laboratories (A.V.L.) have decided to continue their national public information program in all major news media—farm magazines, newspapers, radio, and television.

In addition, special arrangements have been made for 160 showings of the motion picture, "Valiant Years," over television stations around the nation, to an audience that the A.V.L. estimates will be over 6,400,000 persons. This film, which has seen wide service, is being withdrawn from general circulation for television use.

The A.V.L.'s public information program has been carried out over the name of the American Foundation for Animal Health for 20 years. To date, member companies of the A.V.L. have invested more than \$1,000,000 in their program on



This group picture was taken at the entrance of the new veterinary diagnostic laboratory at Iowa State College, Ames, where most of the poultry disease diagnostic short course was conducted.

First row (left to right)—Drs. Donald E. Pietz, Comfrey, Minn.; Leif A. Septon, Eugene, Ore.; Gerald H. Sheridan, Cortland, N. Y.; Ray Ward, Meridian, Miss.; W. M. Reynolds, Dover, Del.; J. H. Kimsey, Gainesville, Ga.; R. E. Omohundro, Washington, D. C.; C. D. Lee, Ames, Iowa; Dean I. A. Merchant, Ames; George W. Bragdon, Augusta, Maine; J. V. McAlpin, Danville, Ky.; John W. Walker, Fredericktown, Ohio; Paul W. Miner, Stockbridge, Mass.; Walker S. Thompson, Burlington, N. Car.; Jack C. Boer, Sacramento, Calif.; and N. W. Spangler, Norfolk, Neb.

Second row (left to right)—Drs. L. Reddin, A.M.S., Philadelphia; Gerald C. Drew, Sulphur Springs, Texas; Charles Hagger, A.M.S., Worthington, Minn.; Walter T. Vaught, Lynchburg, Va.; J. H. Duke, Franklin, Ind.; Robert W. Kiers, Bellingham, Wash.; Harless A. McDaniel, Jackson, Tenn.; Garth Corrie, White Cloud, Minn.; C. W. Thornton, Robertsdale, Ala.; and James M. Huff, McCrory, Ark.

behalf of the veterinary profession. Member companies are identified in the advertisements (adv. pp. 6-7) in this issue of the JOURNAL.

AMONG THE STATES AND PROVINCES

Alabama

North Alabama Association.—The regular, bimonthly meeting of the North Alabama V.M.A. met at the Decatur Country Club Nov. 14, 1957.

Mr. Ransom E. Crawford, civil defense director for Huntsville and Madison counties, discussed the need for veterinarians to provide their services and skills in order to help strengthen and maintain a strong, national defense.

A civil defense committee was appointed to work with the program committee on a series of educational programs designed to help the members of the North Alabama V.M.A. in the event of an emergency.

S/CHARLES L. SMITH, *Public Relations Committee.*

California

Emergency Medical Course for Contra Costa.—The Alameda-Contra Costa Veterinary Medical Association will hold a six-weeks emergency medical course beginning in the first week of February, 1958, at the Acalanes High School in Lafayette.

Mr. Nelson, civil defense director of Contra Costa County, said that the course will take into consideration that most veterinarians are familiar with the routine treatment of emergency cases and that the course will deal with human anesthesia, fractures, shock treatment, and similar subjects instead of the more general categories.

Following the course, the veterinarians will spend several hours of duty as stand-by medical assistants in the emergency room of a hospital.

S/GEORGE H. MULLER, *Secretary.*

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California Association.—The midwinter conference of the California V.M.A. will be held Jan. 27-29, 1958, at the School of Veterinary Medicine, University of California, Davis.

Among the 40 speakers who will address the meeting are: Drs. Jean Holzworth, Angell Memorial Animal Hospital, Boston; Jack Bryans, Kentucky experiment station, Lexington; R. V. Johnston, Pitman-Moore Company, Indianapolis; and Heinz Fraenkel-Conrat, virus laboratory, University of California, Berkeley. A closed-circuit television program will be featured on January 29.

Drs. Charles H. Ozanian and Peter C. Kennedy are program co-chairmen for the meeting.

S/CHARLES C. TRAVERS, *Correspondent.*

Florida

West Coast Auxiliary.—The officers of the West Coast Auxiliary to the Florida State V.M.A. elected for the coming year were reported as follows: Mrs. G. L. Lewallen, St. Petersburg, president; Mrs. Theodore W. Brown, Chipley, vice-president; Mrs. George F. Yopp, Miami, secretary; and Mrs. Peter S. Roy, Jacksonville, treasurer.

Georgia

Dr. Steele Participates in Seminar in Poland.—Dr. James H. Steele, chief of the veterinary section of the U.S. Public Health Service's Communicable Disease Center, Atlanta, participated in a seminar on veterinary Public Health in Warsaw, from Nov. 25 to Dec. 4, 1957. He led the discussions on "Interrelationship of Human and Animal Health in Disease" and on "Reporting of Zoonoses and Their Control."

Veterinary public health services, according to Dr. Steele, are important in dealing with problems of food hygiene and of zoonoses (animal diseases such as brucellosis and rabies which are transmissible to man), and which can not be solved by public health or veterinary authorities working alone.

The seminar was sponsored by the World Health Organization to promote veterinary public health services in countries of the European region of W.H.O. More than 20 European nations were present at the sessions.

Indiana

Tenth District Association.—The Tenth District V.M.A. met on Nov. 21, 1957, in Morristown at the Kopper Kettle, with Dr. and Mrs. O. B. Curry acting as the host and hostess of the meeting. Seventy-six members and wives attended.

Dr. L. A. Snider, chairman of the Indiana V.M.A. public relations committee, introduced Mr. Wallace Sims, Pitman-Moore Company, who discussed the meaning of public relations to the veterinarian.

Mr. Sims emphasized that public relations in the profession was not a one-group project, but that each veterinarian is an important link in professional salesmanship.

S/LOWELL W. HINCHMAN, *Secretary.*

Iowa

National Swine Growers Council.—The annual meeting of the National Swine Growers Council met in Davenport, Nov. 13-15, 1957, at the Blackhawk Hotel.

Dr. H. S. McNutt, University of Wisconsin, presided over the conference on the disease control committee at the council meeting. Among the speakers and their subjects at this conference were: Drs. S. H. McNutt—A Report on the Swine Disease Situation; M. L.

Spear, extension veterinarian, Iowa State College—Artificial Insemination in Swine; and W. C. Vollstedt, Dixon, Iowa—Discussion of Swine Disease Problems.

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Interstate Association.—The forty-third annual meeting of the Interstate V.M.A. was held at the Sheraton-Martin Hotel in Sioux City, Nov. 7-8, 1957.

Among the speakers and their respective subjects on the program were: Drs. Ben F. Schlegel, Lake Park, Iowa—Swine Diseases; O. W. Schalm, Davis, Calif.—Practical Hematology; and J. G. Gracia, Ames—Toxicity of Economic Poisons.

The officers elected for the ensuing year are: Drs. Paul A. Pinkert, Pipestone, president; John Aiken, South Sioux City, Neb., treasurer; and Donald Rubel, Sioux City, secretary.

s/K. W. SMITH, *Secretary*.

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Interstate Auxiliary.—The Women's Auxiliary to the Interstate V.M.A. elected the following officers for the coming year: Mrs. L. T. Railsback, Ellsworth, Minn., president; Mrs. L. T. Jessen, Omaha, Neb., vice-president; Mrs. N. W. Kruse, Genoa, Neb., secretary; and Mrs. Donald Rubel, Sioux City, treasurer.

Kansas

Kansas City Association.—The regular meeting of the Kansas City V.M.A. was held at the Hotel President, Kansas City, on Nov. 21, 1957.

Dr. C. T. Mason, Little Rock, Ark., spoke on "Cutting Costs and Increasing Profits in Veterinary Practice."

s/R. E. GUILFOIL, *Secretary-Treasurer*.

Minnesota

Dr. William H. Feldman Accepts Post with Veterans Administration.—Dr. William H. Feldman (COL '17), a member of the staff of the Mayo Foundation and Clinic since 1927, left Rochester in the first week of October to become chief of laboratory research in pulmonary diseases in the Department of Medicine and Surgery of the central office staff of the Veterans Administration in Washington, D. C.

In the Washington post, Dr. Feldman's responsibilities will include participation in the laboratory aspects of cooperative studies in the chemotherapy of tuberculosis, coccidioidomycosis, histoplasmosis, sarcoidosis and the nontuberculous mycobacterial infections, as well as other coordinated projects developed by the Tuberculosis Service and the Research Service of the Department of Medicine and Surgery.

Nebraska

State Association.—The sixty-first annual meeting of the Nebraska State V.M.A. met at the Hotel Cornhusker in Lincoln on Dec. 3-5, 1957.

Among the speakers and their respective subjects included on the program were: Drs. H. E. Kingman, Jr., assistant executive secretary of AVMA—Report of the AVMA; E. A. Woelffer, Oconomowoc, Wis.—Dairy Cattle Problems and Sterility; Wayne H. Riser, J.A.V.M.A. editor, small animal medicine—Canine Surgery; E. C. Barrows, Wyoming Hereford Ranch, Cheyenne—Problems Encountered in the Range and Pure Bred Cattle; and Grant Misener, Chicago—Canine Parasitology and Strontium-90 Applicator.

The officers elected by the Nebraska V.M.A. for the ensuing year are: Drs. D. A. Phillipson, Sioux City, Iowa, president; C. B. Schwab, Fairbury, vice-president; and W. T. Spencer, Lincoln, secretary.

Dr. E. W. Peck, Auburn, was named state delegate to the national convention of the AVMA in Philadelphia in August.

New York

State Association.—The Veterinary Medical Association of New York City, Inc., was held at the New York Academy of Sciences on Dec. 4, 1957.

Dr. W. Kapland, Communicable Disease Center, U.S. Public Health Service, Chamblee, Ga., discussed and illustrated the "Fungus Diseases of Dogs and Cats and Their Public Health Importance."

s/ROBERT L. BURKHART, *Program Committee*.

Nova Scotia

Nova Scotia Association.—The annual meeting of the Nova Scotia Veterinary Association was held Nov. 13, 1957, at Truro. President E. B. North, Kentville, presided.

Dr. Ainslie, Halifax, extended greetings to the association's members from Dr. H. S. McFatridge, the only living member of the first council of the Nova Scotia association.

The following officers were elected for the coming year: Drs. E. B. North, president; R. W. Kennedy, Sydney River, vice-president; A. R. Main, Truro, secretary; and K. W. Trenholm, Kentville, registra-treasurer.

STATE BOARD EXAMINATIONS

ARIZONA—Jan. 22-23, 1958. Phoenix. E. R. Hinshaw, secretary, P. O. Box 462, Buckeye, Ariz.

CALIFORNIA—January 30-31 and Feb. 1, 1958. Davis. William E. Barbeau, executive secretary, 1020 N. St., Sacramento 14, Calif.

COLORADO—Jan. 15-16, 1958, Arvada; and first week in June, depending on graduation date. Fort Collins. W. D. Stauffer, secretary, 5500 Wadsworth Blvd., Arvada, Colo.

CONNECTICUT—Jan. 14-16, 1958, Hartford. Richard J. Gorman, secretary, State Office Building, Hartford, Conn.

MONTANA—Jan. 31-Feb 1, 1958, Bozeman. J. W. Safford, secretary, Montana Veterinary Research Laboratory, Bozeman.

NORTH DAKOTA—April 9-10, 1958, Fargo. M. C. Hawn, secretary-treasurer, 1407 13 St. N., Fargo, N. Dak.

TEXAS—Jan. 15-17, 1958, Austin. T. D. Weaver, executive secretary, 207 Capital National Bank Building, Austin 16, Texas.

DEATHS

Star indicates member of AVMA

Adolph Berg (BER '06), 74, Chalfont, Pa., died Nov. 15, 1957, in the Neshaminy Manor Home, after a heart attack.

Dr. Berg was a civic leader as well as a worthy exponent of the veterinary profession. He was a former president of the Pennsylvania State V.M.A. and a former director of the Doylestown school board which he headed for 17 years.

He is survived by his daughter, Mrs. Winfred Shisler, and two brothers.

Elvon S. Dickey (KCV '06), 83, Ottumwa, Iowa, widely known veterinarian and former federal meat inspector for more than 30 years, died on Nov. 6, 1957, from a heart ailment.

Born in 1874, at Olathe, Kan., Dr. Dickey studied pharmacy at the University of Kansas and then taught pharmacy at the Kansas City Veterinary College, studying veterinary medicine at the same time.

Following graduation, he entered the federal service, retired from it in 1936, and then organized the veterinary department of the John Morrell Company, which he headed for nine years. In recent years, he had been in charge of the pharmacy department of the Ottumwa hospital.

Surviving are his widow, Caroline Skuey Dickey, and one daughter.

★Howard D. Hilton (MSC '25), 59, Mill Valley, Calif., died Oct. 12, 1957, after a heart attack.

A native of Michigan, Dr. Hilton moved to California in 1929, and practiced veterinary medicine in the federal and state governments. In 1943, he went to Mill Valley and the following year established the Mill Valley Pet Hospital, where he remained until failing health forced his retirement in 1951.

Dr. Hilton was a member of the California V.M.A. and the Marin Rod and Gun Club. He is survived by his wife, Alma L. Hilton, a daughter, and a son.

★John R. Martell (ONT '28), 56, Spring Lake, Mich., died Nov. 4, 1957, after suffering a heart attack while on a hunting trip near Grand Sable Lake in the Upper Peninsula.

Dr. Martell was born in Wallaceby, Ont., and came to live in the United States in 1920. He served with the U.S. Army in 1942-1943, and has been a practicing veterinarian in Michigan since 1944. A member of the American Legion, Merritt Lamb Post, and the Ontario Veterinary Society, Dr. Martell formerly had served as district president of the Michigan State V.M.A.

He is survived by his wife, two sons, and a brother.

★F. Earle Martin (UP '33), 67, West Chester, Pa., died in the Chester County Hospital, Oct. 15, 1957.

After graduating from the University of Pennsylvania in 1933, Dr. Martin had practiced veterinary medicine for nine years when he became head of Martin Laboratories in West Chester. He is survived by his wife, a son, and a sister.

Charles D. Tofflemire (STJ '21), 68, Marshall, Mo., died Oct. 28, 1957, after a lingering illness.

Following graduation, Dr. Tofflemire entered general practice at Breckenridge, Mo. He practiced in Breckenridge and Cameron, Mo., until his death, except for the time he spent with the U.S. Department of Agriculture.

Dr. Tofflemire joined the Poultry Inspection Service, U.S.D.A., on July 1, 1946, serving various localities in the Middlewest. He is survived by his widow, Mrs. Eunice Tofflemire.

★Edward H. Welles, Sr. (API '17), 64, Newbern Tenn., died in the Obion County Hospital in Union City, Oct. 3, 1957.

Dr. Welles was born in Obion County and made his home there for many years, moving to Newbern to practice veterinary medicine in 1937. He was active in the interests of young people and a leader in the Boy Scouts. Dr. Welles was also active in Masonic affairs and a member of the Mulherin Post of the American Legion at Newbern.

He is survived by his wife, Ann Porch Welles, two daughters, a son, and a sister.

• • •

Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

R. F. Fletcher (CVC '18), Platteville, Wis., died Oct. 28, 1957.

★H. M. Gray (MCK '19), Hampshire, Ill., died Nov. 6, 1957.

Charles H. Hart (CVC '11), St. Paul, Minn.

★Col. James E. Noonan (ONT '11), Rolling Hills, Calif., died in June, 1957.

Howard J. Watson (KCV '17), Sacramento, Calif.

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Reprint from the American
Journal of Veterinary
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The Practical Results of Sensitivity Tests in Small Animal Practice

Margaret Schlichting, B.A.
April 1955

THE PRACTICAL RESULTS OF SENSITIVITY TESTS IN SMALL ANIMAL PRACTICE

by Margaret Schlichting, B.A.

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BOVINE BLOOD SERUM CONCENTRATIONS OF CHLOROMYCETIN FOLLOWING INTRAMUSCULAR ADMINISTRATION

by F. E. Eads, D.V.M., M.S.
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Reprint from The Cali-
fornia Veterinarian

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President—Mrs. Leslie H. Moe, 1814 W. Third Ave., Stillwater, Okla.

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Newspaper Clipping.—In Cleveland, on Aug. 20, 1957, at the meeting of the AVMA Auxiliary house of representatives, the following motion was voted and unanimously passed: That the Public Relations Media Committee be empowered to ask the delegates to act as a newspaper clipping service for the AVMA.

This is the Auxiliary's first legislative act in response to the AVMA's request for Auxiliary participation in this most important project, and we are looking forward to the wholehearted support of each individual Auxiliary member so that the delegates can successfully carry out this undertaking.

The AVMA invited this activity to fill a need for information on press reception of veterinary news, without using AVMA public relations funds.

The AVMA Public Relations Committee, at their meeting in Chicago on October 21, directed the AVMA Public Relations Department to send a letter to the Women's Auxiliary explaining how the clippings solicited by them fit into the national public relations program and to encourage cooperation in this program. The clippings are used to evaluate the effect and usage of AVMA material and to ascertain public and press opinion of the profession.

Mr. Brian Forster, AVMA Public Relations director, asked that each Auxiliary member clip and forward to her house delegate clippings of all newspaper articles pertaining to veterinary medicine. She will then forward them to AVMA headquarters in Chicago.

These clippings would include mention of a doctor of veterinary medicine in any connection, including obituaries; a mention of veterinary, veterinarian, "vet.," animal doctor, extension veterinarian, a school or college of veterinary medicine, a veterinary association; municipal, county, state, or federal proposals on animal disease or the veterinary profession, and human interest material on injured animals or animal hospitals.

s/Mrs. J. J. FISHLER, *Chairman, Public Relations Media Committee.*



Instructions to Authors

JOURNAL of the AVMA

Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals, which is ethical publication procedure.

Manuscripts.—Manuscripts, including footnotes, references, and tables, must be typewritten, double-spaced, on 8½- by 11-in. bond paper, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise. Short, simple sentences are clearer and more forceful than long, complex ones.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the JOURNAL of the American Veterinary Medical Association with a minimum of reduction. Photomicrographs which can not be reduced should be marked for cropping to 1-column or 2-column width. Identifying marks within the photomicrographs, such as arrows, letters, or numbers, should be clearly marked with black India ink or white opaque ink to insure good reproduction and must be large enough to stand reduction, if necessary.

Drawings, graphs, and charts should be made clearly and accurately in India ink on white paper and a glossy print of them submitted when possible. Numbers or letters appearing on graphs or charts should be large enough to allow for any reduction necessary for the chart or graph to fit JOURNAL pages. Blue lines in graph paper drop out in reproduction; therefore, if lines are required they must be drawn in black ink. All illustrations should bear the name of the author and the illustration number on the back.

Tables.—Tables should be simple and typed double space. Complex tables are not conducive to perusal. It is wiser to summarize complex material than to tabulate it.

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COMING MEETINGS

South Carolina Association of Veterinarians. Winter meeting. Hotel Columbia, Columbia, S. C., Jan. 18, 1958. Worth Lanier, secretary-treasurer.

Minnesota Veterinary Medical Association. Annual meeting. St. Paul Hotel, St. Paul, Jan. 20-22, 1958. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn., secretary.

District of Columbia Veterinary Medical Association. Annual meeting. Dart Auditorium, Armed Forces Institute of Pathology, Washington, D.C., Jan. 21, 1958. William I. Gay, 5200 Chandler St., Bethesda, Md.

Michigan State University. Thirty-fifth annual postgraduate conference for veterinarians, Jan. 22-23, 1958. College of Veterinary Medicine, Michigan State University, East Lansing. W. W. Armistead, dean.

California Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Jan. 27-29, 1958. C. S. Travers, 3004 16th St., San Francisco, executive secretary.

Louisiana State University. Annual veterinary conference. Louisiana State University, Baton Rouge, Jan. 28-29, 1958. W. T. Oglesby, Baton Rouge 3, La., head.

North Carolina State College. Conference for veterinarians. North Carolina State College, Raleigh, Jan. 28-31, 1958. C. D. Grinnells, chairman.

Maryland State Veterinary Medical Association. Annual Winter meeting. Emerson Hotel, Baltimore, Md., Jan. 30-31, 1958. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore 14, Md., secretary-treasurer.

Oregon Veterinary Medical Association. Winter meeting. Portland, Jan. 31-Feb. 1, 1958. Edward L. Holden, P. O. Box 445, Oswego, secretary.

Virginia Veterinary Medical Association. Annual meeting.

John Marshall Hotel, Richmond, Feb. 2-4, 1958. Carl E. Boyd, 1308 E. Franklin St., Richmond, program chairman.

Missouri Veterinary Medical Association. Hotel Continental, Kansas City, Mo., Feb. 9-10, 1958. W. L. Schondelmeyer, 116 E. Maple, Independence, Mo., chairman.

Wisconsin Veterinary Medical Association. Forty-second annual meeting. Hotel Pfister, Milwaukee, Wis., Feb. 10-12, 1958. Burr A. Beach, Veterinary Science Bldg., University of Wisconsin, Madison 6, Wis., secretary.

New Jersey Veterinary Medical Association. Seventy-fourth annual meeting. Hotel Berkeley-Carteret Hotel, Asbury Park, N. J., Feb. 12-13, 1958. John R. McCoy, Rutgers University, New Brunswick, N. J., secretary.

American Veterinary Radiology Society. Regular meeting. LaSalle Hotel, Chicago, Feb. 16, 1958, at 1:00 p.m. J. J. Fishler, secretary-treasurer.

Region Four American Animal Hospital Association. Winter meeting. Veterinary Clinic, Fort Collins, Colo., Feb. 16, 1958. D. T. Albrecht, secretary.

Colorado State University. Nineteenth annual veterinary conference. Glover Veterinary Hospital, College of Veterinary Medicine, Colorado State University, Fort Collins, Colo., Feb. 17-19, 1958. Lloyd C. Moss, head Department of Medicine, Colorado State University, secretary.

Illinois State Veterinary Medical Association. Annual convention. LaSalle Hotel, Chicago, Feb. 17-19, 1958. C. B. Huestler, 1305 Whitcomb Ave., Des Plaines, Ill., executive-secretary.

Alabama Veterinary Medical Association. Annual meeting. Hotel Stafford, Tuscaloosa, March 16-18, 1958. McKenzie Heath, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, secretary.

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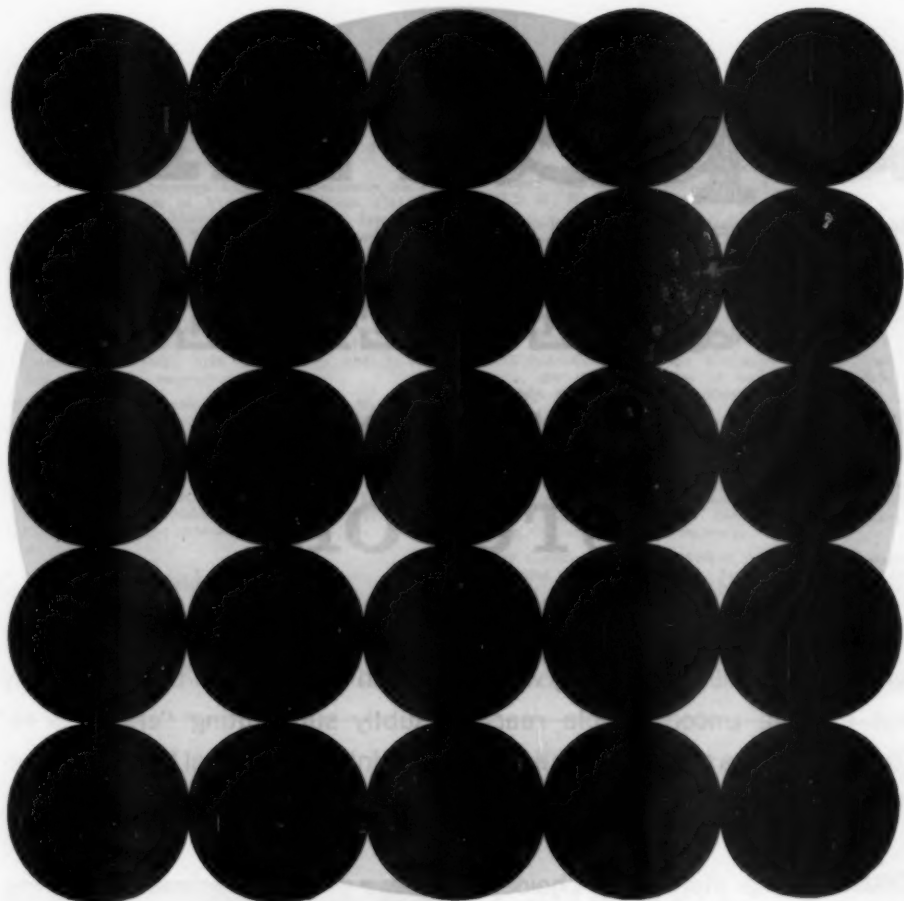


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Washington, State College of. Annual Conference of Veterinarians. Pullman, Wash. April 7-9, 1958. W. R. Leader, program chairman.

American Animal Hospital Association. Silver anniversary meeting. Drake Hotel, Chicago, Ill., April 23-26, 1958. Dr. Wayne H. Riser, secretary.

Oklahoma State University. Oklahoma conference for Veterinarians. College of Veterinary Medicine, Oklahoma State University, Stillwater, May 3-6, 1958. Lester Johnson, Department of Veterinary Medicine and Surgery, chairman.

Michigan Veterinary Medical Association. Annual meeting. Grand Hotel, Mackinaw Island, June 2-4, 1958. Charles Coy, Hillsdale, general chairman.

North Carolina State Veterinary Medical Association. Fifty-seventh annual meeting. The Washington Duke Hotel, Durham, June 24-26, 1958. C. J. Lange, 3741 Hi-Point Rd., Greenboro, secretary-treasurer.

New York State Veterinary Medical Society. Sixty-seventh annual meeting. Concord Hotel, Kiamasha Lake, N. Y., Sept. 10-12, 1958. Joan S. Halat, 803 Varick St., Utica, N. Y., executive secretary.

New England Veterinary Medical Association. Annual meeting. Hotel Wentworth, Portsmouth, N. H., Sept. 21-24, 1958. C. Lawrence Blakely, 100 Longwood Ave., Boston 15, Mass., secretary-treasurer.

Foreign Meetings

Sixth International Congresses on Tropical Medicine and Malaria. Lisbon, Portugal, Sept. 3-13, 1958. Professor Manuel R. Pinto, Institute of Tropical Medicine, Lisbon, secretary-general. (Membership application forms may be obtained by U.S. veterinarians by writing to the AVMA.)

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwaoder, Decatur, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2 Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December at 3004 16th St., San Francisco, Calif. Mr. Herb Warren, executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

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Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. C. Lawson, 40-40 El Camino, Palo Alto, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restau-

rant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 37, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, in St. Petersburg. R. L. Brutus, 336 E. 15th St., Hialeah, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant, P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

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South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Frank Mueller, Jr., 4148 E. 8th Ave., Hialeah, Fla., secretary.

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ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P. O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Association, the second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. Dr. J. G. Irwin, Iowa City, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

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Figure 1

History.—A Standardbred filly, 4 years old, had been lame on the right foreleg for three months. She had been lame on the same leg a year previously but recovered without a diagnosis or treatment. The tendon of the common digital extensor muscle seemed relaxed and the limb frequently “bucked” at the carpal joint while the mare was standing. A dorsovolar radiograph of the digit was taken.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—A complete fracture of the lateral portion of the navicular bone of the right forelimb of a horse.

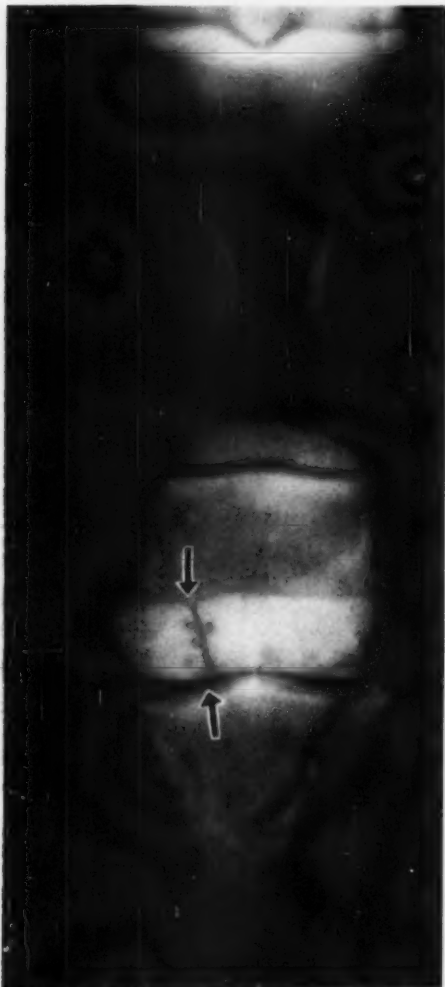


Fig. 2—Notice the serrated appearance of the fracture line (arrows), probably the result of aseptic necrosis.

First Comment.—Because of the considerable area of aseptic necrosis along the fracture line, this fracture would appear to be several weeks or months old. This condition was formerly considered a pathological fracture, the result of navicular disease. However, the evidence in this clinic does not support that contention. Severe trauma may be an etiological factor. No treatment is likely to be effective.

Second Comment.—It is agreed that this filly would never stand training; also that such fractures probably result from trauma, and seldom occur while racing on a track where a cushion is maintained (as for Thoroughbred racing). They seem to occur more commonly on a hard track. Relief may result from shoeing with blocked heels of increasing depth to reduce pressure on the navicular bone.

This case was submitted by Dr. F. J. Milne, M.R.C.V.S., professor of Surgery and Obstetrics, Ontario Veterinary College, Guelph, Ont.

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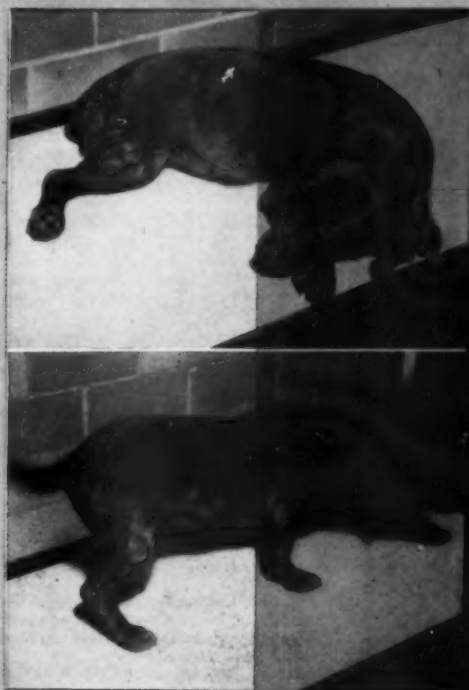
²Burns, J.J., Schuier, A., Chenkin, T., Goldman, A., and Brodie, B.B.: J. Pharmacol. & Exper. Therap., 100, 530, 1952

³Lieberman, L.L.: J. Am. Vet. M.A., 125, 128, 1954

⁴Joshua: Vet. Rec., Jan. 21, 1956

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Piedmont Veterinary Medical Association, the last Friday of each month. John G. Martin, Boone, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Thursday of each month in the Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. James R. Burgess, Rockingham, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every other month at 7:00 p.m., in the George Vanderbilt Hotel, Asheville, N. Car. Vilu Lind, 346 State St., Marion, N. Car., secretary.

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(Classified ads continued on adv. p. 48)

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Miscellaneous

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*U.S. Patent No. 2,772,167

¹J. of Nutrition, 53:1, May, 1954.

²Armour Research Foundation Report Project No. C616.

³Jensen-Salsbery Research Data: In press.

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